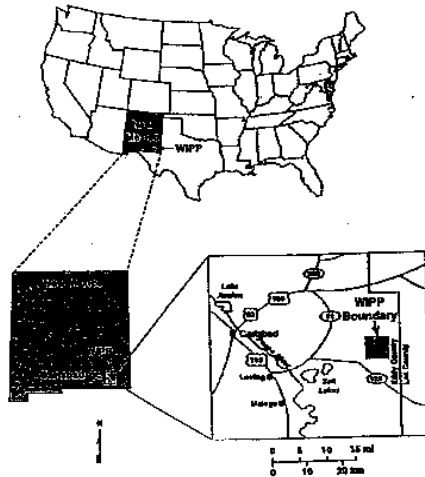


**ATTACHMENT I2  
APPENDIX E**

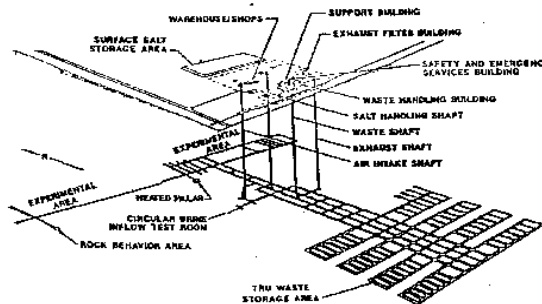
**DESIGN DRAWINGS**

**SHAFT SEALING SYSTEM  
COMPLIANCE SUBMITTAL DESIGN REPORT**

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WIPP LAYOUT



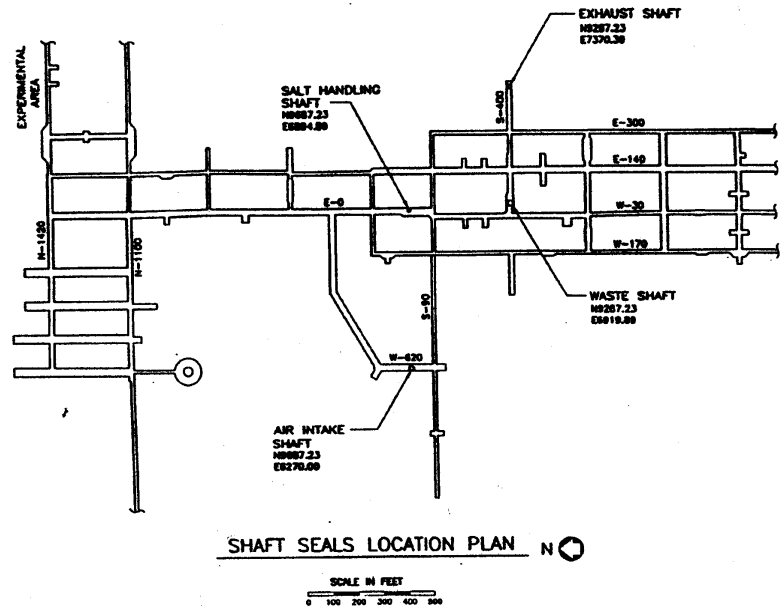
## WASTE ISOLATION PILOT PLANT

CARLSBAD, NM

## SHAFT SEALING SYSTEM DESIGN

### DESIGN DRAWINGS

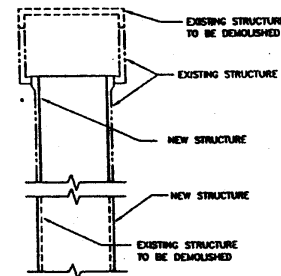
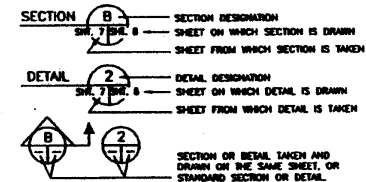
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SNL-007 1 OF 28	WIPP SHAFT SEALING SYSTEM SHAFT LOCATION PLAN, ABBREVIATIONS, GENERAL NOTES AND LEGEND	SNL-007 10 OF 28	WIPP SHAFT SEALING SYSTEM SALADO FORMATION AIR INTAKE SHAFT STRATIGRAPHY & SEALING SUBSYSTEM PROFILE	SNL-007 19 OF 28	WIPP SHAFT SEALING SYSTEM NEAR-SURFACE/RUSTLER FORMATIONS SALT HANDLING SHAFT STRATIGRAPHY & SEALING SUBSYSTEM PROFILE
SNL-007 2 OF 28	WIPP SHAFT SEALING SYSTEM NEAR-SURFACE/RUSTLER FORMATIONS WASTE SHAFT STRATIGRAPHY & AS-BUILT ELEMENTS	SNL-007 13 OF 28	WIPP SHAFT SEALING SYSTEM AIR INTAKE SHAFT SHAFT STATION MONOLITH	SNL-007 20 OF 28	WIPP SHAFT SEALING SYSTEM SALADO FORMATION SALT HANDLING SHAFT STRATIGRAPHY & SEALING SUBSYSTEM PROFILE
SNL-007 3 OF 28	WIPP SHAFT SEALING SYSTEM SALADO FORMATION WASTE SHAFT STRATIGRAPHY & AS-BUILT ELEMENTS	SNL-007 12 OF 28	WIPP SHAFT SEALING SYSTEM NEAR-SURFACE/RUSTLER FORMATIONS EXHAUST SHAFT STRATIGRAPHY & AS-BUILT ELEMENTS	SNL-007 21 OF 28	WIPP SHAFT SEALING SYSTEM SALT HANDLING SHAFT SHAFT STATION MONOLITH
SNL-007 4 OF 28	WIPP SHAFT SEALING SYSTEM NEAR-SURFACE/RUSTLER FORMATIONS WASTE SHAFT STRATIGRAPHY & SEALING SUBSYSTEM PROFILE	SNL-007 13 OF 28	WIPP SHAFT SEALING SYSTEM SALADO FORMATION EXHAUST SHAFT STRATIGRAPHY & AS-BUILT ELEMENTS	SNL-007 24 OF 28	WIPP SHAFT SEALING SYSTEM CONCRETE-ASPHALT WATERSTOP IN SALADO FORMATION
SNL-007 5 OF 28	WIPP SHAFT SEALING SYSTEM SALADO FORMATION WASTE SHAFT STRATIGRAPHY & SEALING SUBSYSTEM PROFILE	SNL-007 14 OF 28	WIPP SHAFT SEALING SYSTEM NEAR-SURFACE/RUSTLER FORMATIONS EXHAUST SHAFT STRATIGRAPHY & SEALING SUBSYSTEM PROFILE	SNL-007 24 OF 28	WIPP SHAFT SEALING SYSTEM UPPER AND LOWER SALADO COMPACTED CLAY COLUMNS
SNL-007 6 OF 28	WIPP SHAFT SEALING SYSTEM WASTE SHAFT SHAFT STATION MONOLITH	SNL-007 15 OF 28	WIPP SHAFT SEALING SYSTEM SALADO FORMATION EXHAUST SHAFT STRATIGRAPHY & SEALING SUBSYSTEM PROFILE	SNL-007 25 OF 28	WIPP SHAFT SEALING SYSTEM COMPACTED SALT COLUMN
SNL-007 7 OF 28	WIPP SHAFT SEALING SYSTEM NEAR-SURFACE/RUSTLER FORMATIONS AIR INTAKE SHAFT STRATIGRAPHY & AS-BUILT ELEMENTS	SNL-007 16 OF 28	WIPP SHAFT SEALING SYSTEM EXHAUST SHAFT SHAFT STATION MONOLITH	SNL-007 26 OF 28	WIPP SHAFT SEALING SYSTEM CONCRETE FILL
SNL-007 8 OF 28	WIPP SHAFT SEALING SYSTEM SALADO FORMATION AIR INTAKE SHAFT STRATIGRAPHY & AS-BUILT ELEMENTS	SNL-007 17 OF 28	WIPP SHAFT SEALING SYSTEM NEAR-SURFACE/RUSTLER FORMATIONS SALT HANDLING SHAFT STRATIGRAPHY & AS-BUILT ELEMENTS	SNL-007 27 OF 28	WIPP SHAFT SEALING SYSTEM RUSTLER COMPACTED CLAY COLUMN
SNL-007 9 OF 28	WIPP SHAFT SEALING SYSTEM NEAR-SURFACE/RUSTLER FORMATIONS AIR INTAKE SHAFT STRATIGRAPHY & SEALING SUBSYSTEM PROFILE	SNL-007 28 OF 28	WIPP SHAFT SEALING SYSTEM SALADO FORMATION SALT HANDLING SHAFT STRATIGRAPHY & AS-BUILT ELEMENTS	SNL-007 28 OF 28	WIPP SHAFT SEALING SYSTEM COMPACTED EARTH FILL AND CONCRETE FILL



#### GENERAL NOTES:

1. THE SHFT NUMBERING SYSTEM (E-300, S-400, ETC.) IS BASED ON THE DIRECTION AND NOMINAL DISTANCE IN FEET THE SHFT IS FROM THE SALT HANDLING SHAFT'S DESIGNATED CENTERLINE LOCATION OF N-000, E-000. THE WPP PLANT COORDINATE SYSTEM CENTERLINE LOCATION FOR THE SALT HANDLING SHAFT IS N8887.23, AND E8884.89. THE PLANT COORDINATE SYSTEM IS DESCRIBED IN WESTINGHOUSE DRAWING NO. 51-W-100-W, UNDERGROUND EXCAVATIONS, DATED 8/15/92.
2. THE AS-BUILT DIMENSIONS AND DEPTHS AND/OR ELEVATIONS SHOWN IN THESE DRAWINGS ARE NOMINAL. IN THIS DIMENSIONS MAY CHANGE DUE TO LOCAL VARIANCE OF THE ENVIRONMENTAL CONDITIONS. MODIFICATIONS MADE TO SATISFY THE CRISP CLOSURE OF THE SHAFT, AND OTHER OPERATIONAL REQUIREMENTS. THEREFORE THE AS-BUILT DIMENSIONS AND THE PERTINENT ELEVATIONS FOR THE SEALING SYSTEM SHALL BE VERIFIED BY FIELD SURVEYS AND EXPLORATORY CORE DRILLING DURING SITE PREPARATION FOR THE FINAL CONSTRUCTION.
3. **DRAWING NUMBERS.**  
FOR CLARITY ON DETAIL AND SECTION DESIGNATIONS, AND NOTES, ONLY THE SHEET NUMBER IS SHOWN.

#### LEGEND FOR PROPOSED SHAFT SEALING SYSTEM:



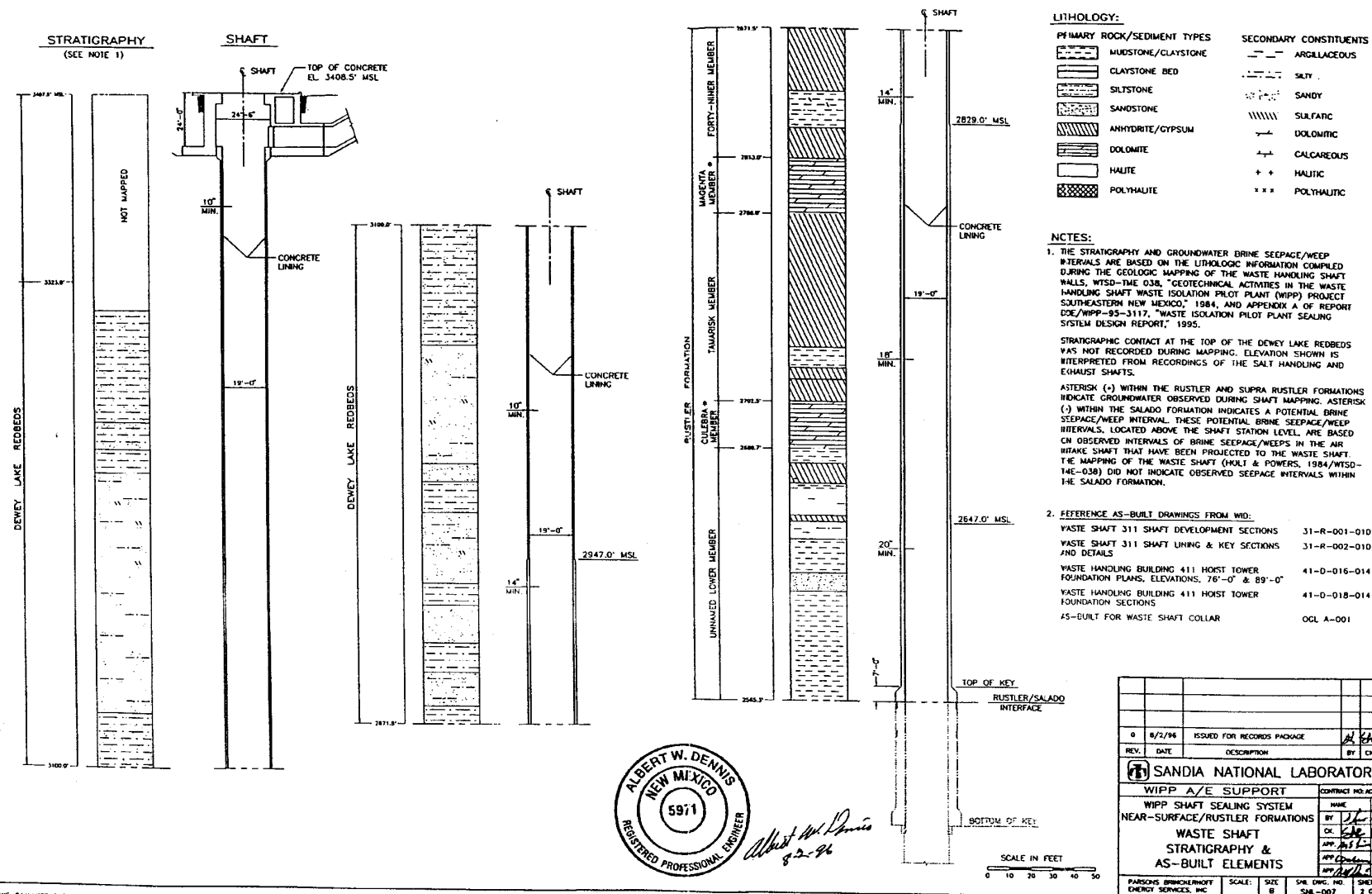
#### ABBREVIATIONS:

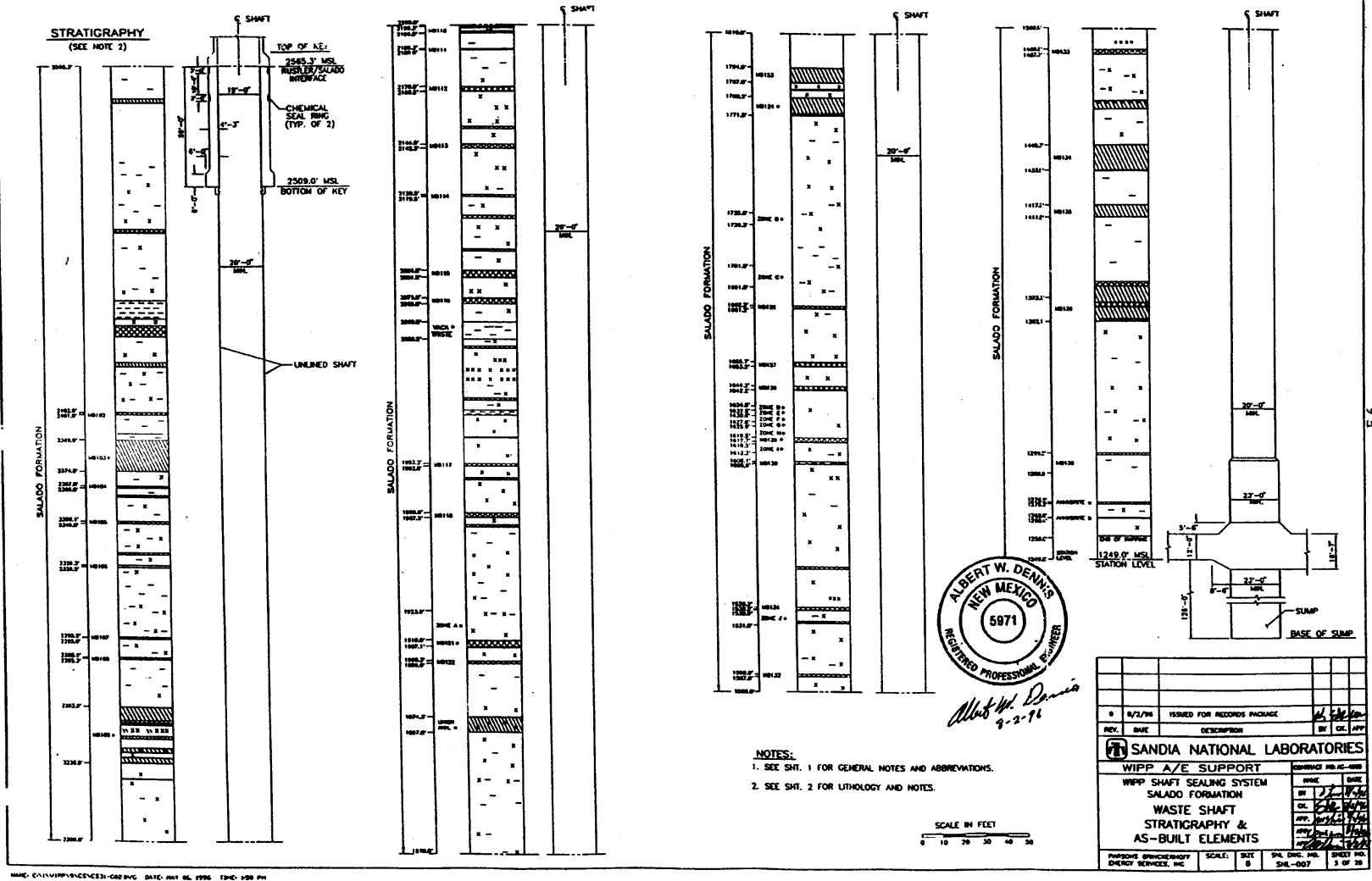
E	CENTERLINE
ANL	ANNOUITE
CMP	CORRUGATED METAL PLATE
CONC.	CONCRETE
DOE	DEPARTMENT OF ENERGY
DWG.	DRAWING
E	EAST
EL.	ELEVATION
EXIST.	EXISTING
FT.	FOOT, FEET
HT.	HEIGHT
I.D.	INSIDE DIAMETER
IN.	INCHES
MB	MARKER BED
MBL	MINIMUM
MSL	MEAN SEA LEVEL
N	NORTH
NO.	NUMBER
R	RADIUS
S	SOUTH
SHT.	SHEET NUMBER
SMC	SALADO MASS CONCRETE
TYP.	TYPICAL
USGS	UNITED STATES GEOLOGICAL SURVEY
W	WEST
WID	WESTINGHOUSE WASTE ISOLATION DIVISION
WPP	WASTE ISOLATION PILOT PLANT

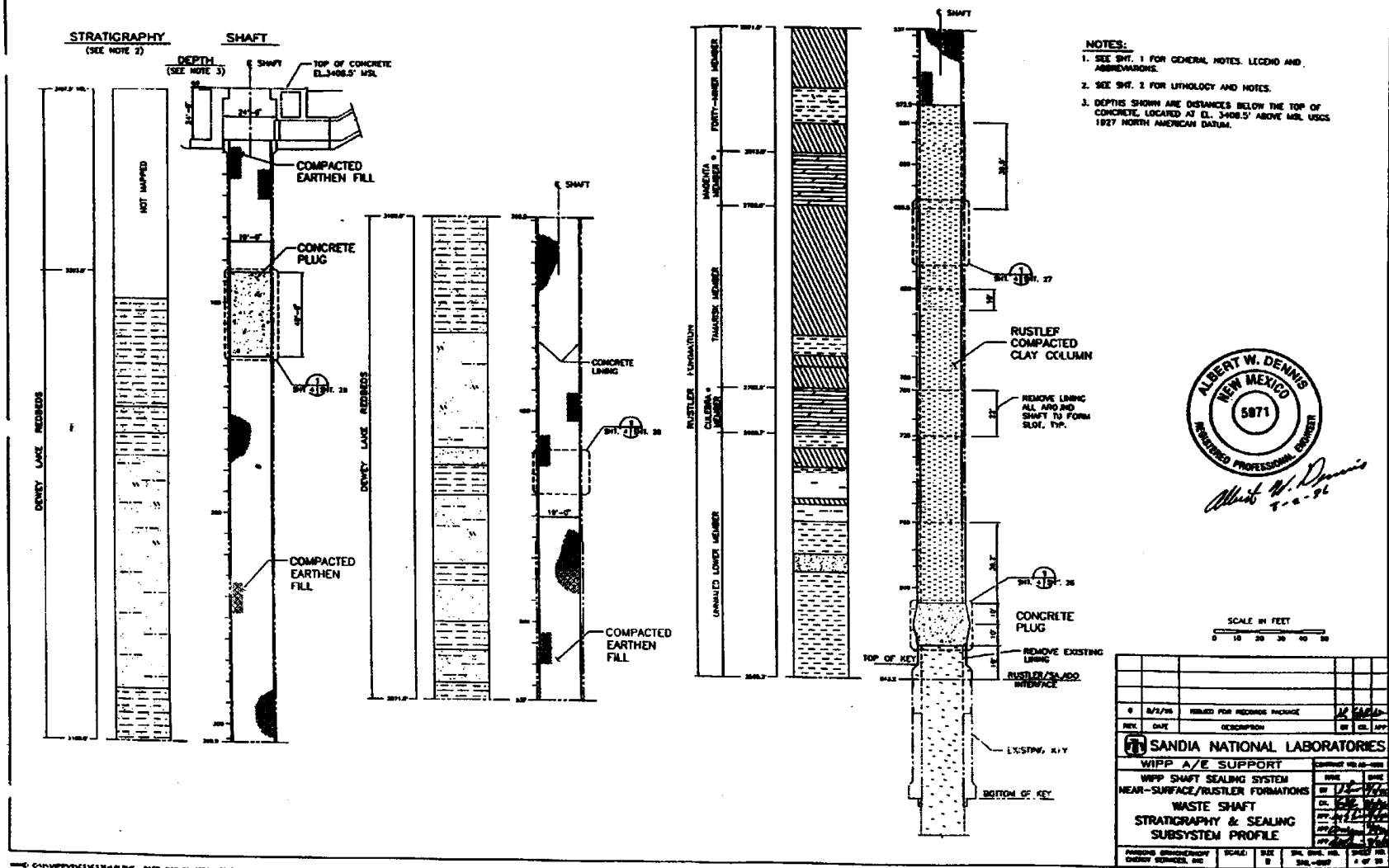


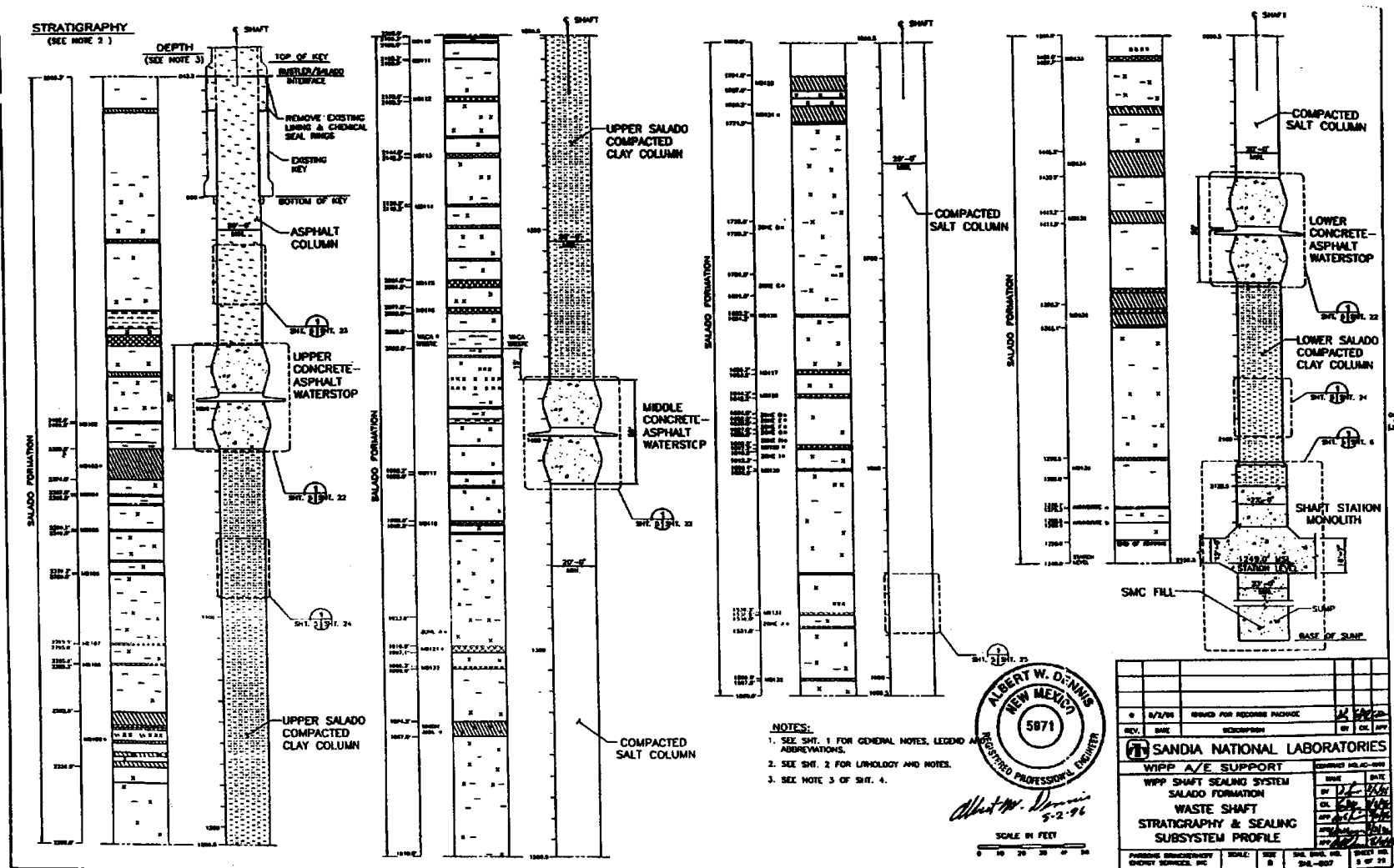
*Albert W. Dennis*  
9-2-96

REV.	DATE	DESCRIPTION	BY	CL.	APP.
1	8/2/96	ISSUED FOR RECORD PACKAGE			
<b>SANDIA NATIONAL LABORATORIES</b> <b>WIPP A/E SUPPORT</b> <b>WPP SHAFT SEALING SYSTEM</b> <b>SHAFT LOCATION PLAN,</b> <b>ABBREVIATIONS, GENERAL</b> <b>NOTES AND LEGEND</b>					
PREPARED BY: SANDIA NATIONAL LABORATORIES CHECKED BY: SANDIA NATIONAL LABORATORIES DATE: 8/2/96		SCALE: 1" = 100' SHEET NO.: 1 OF 28			

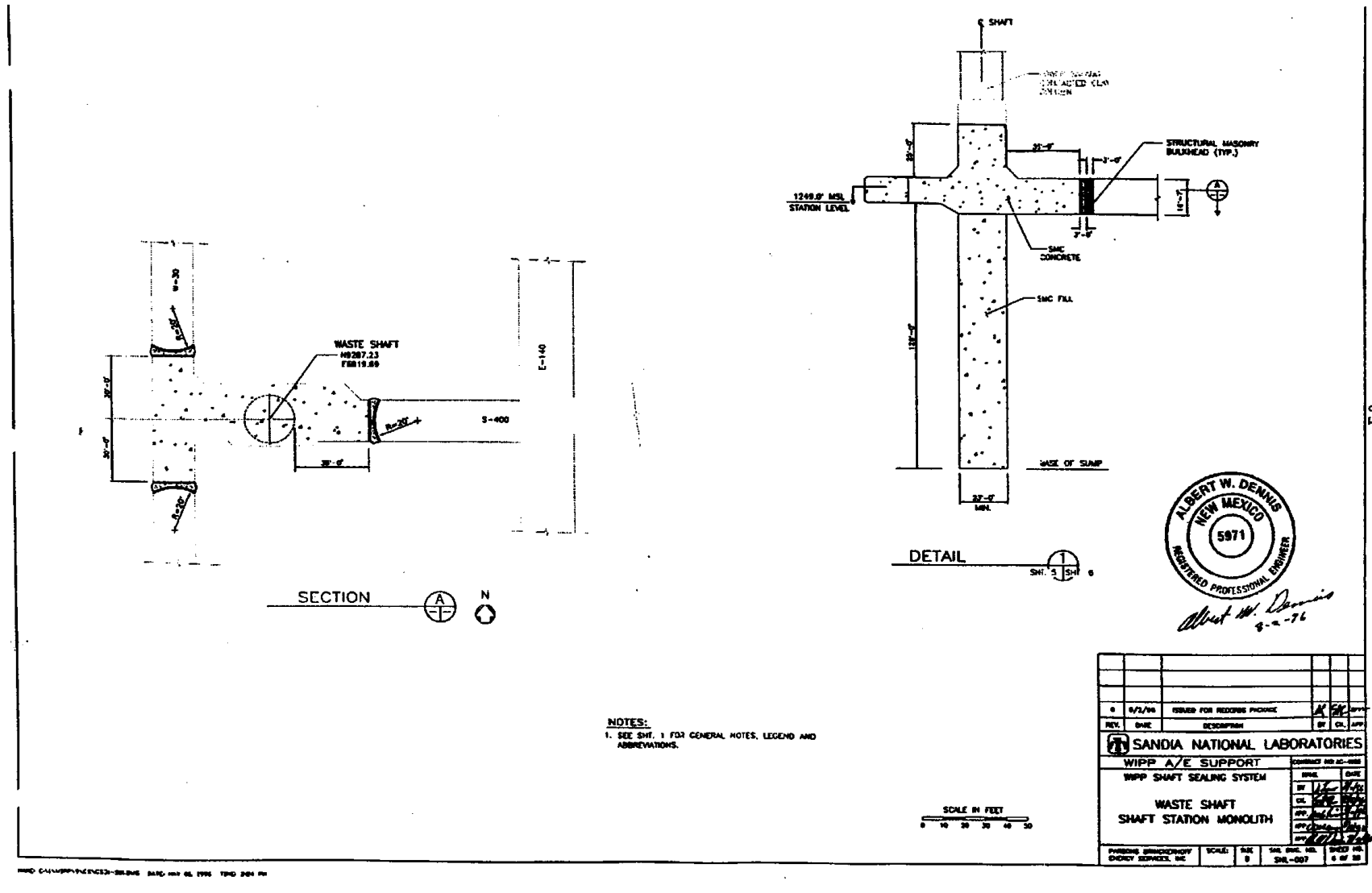


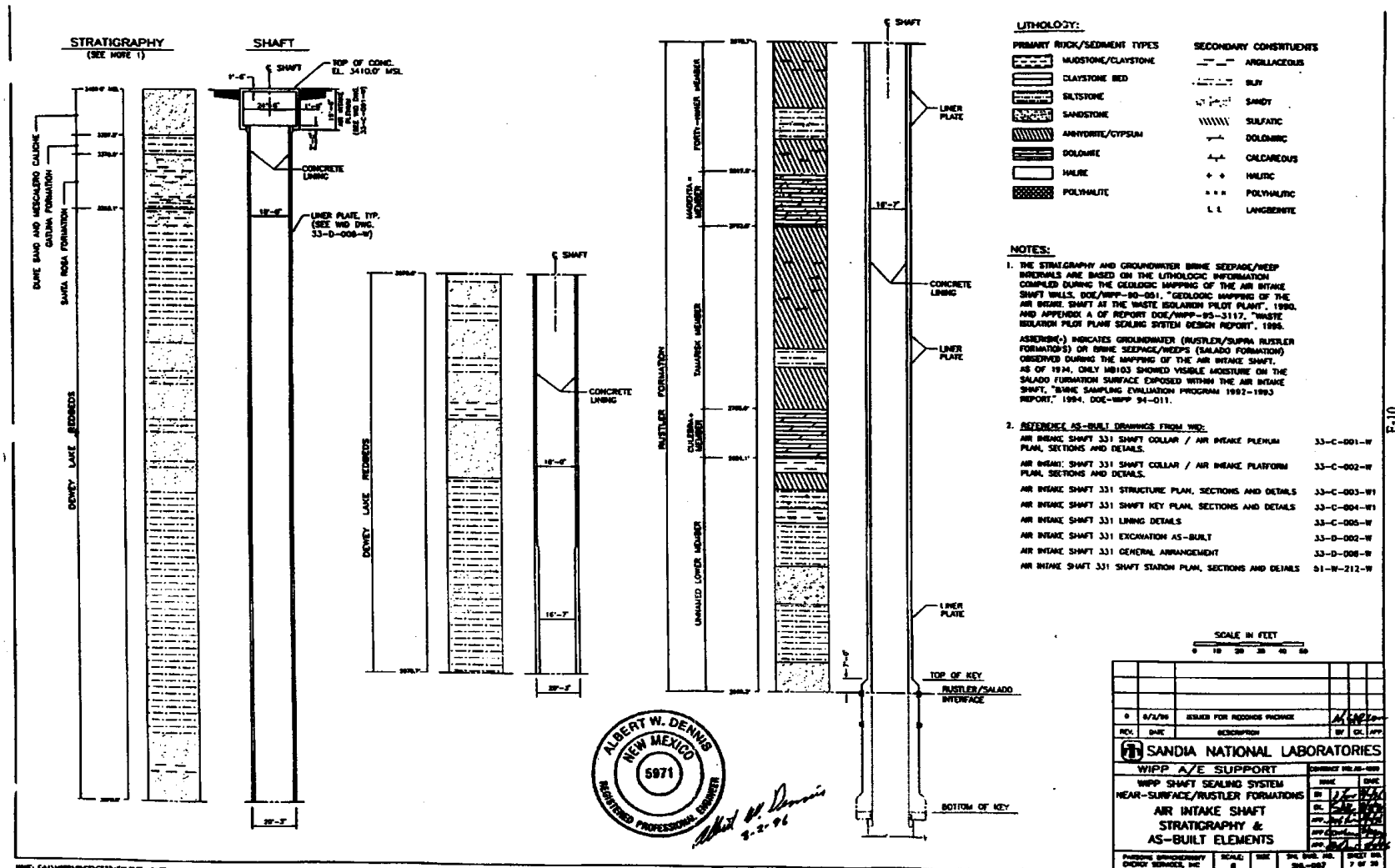


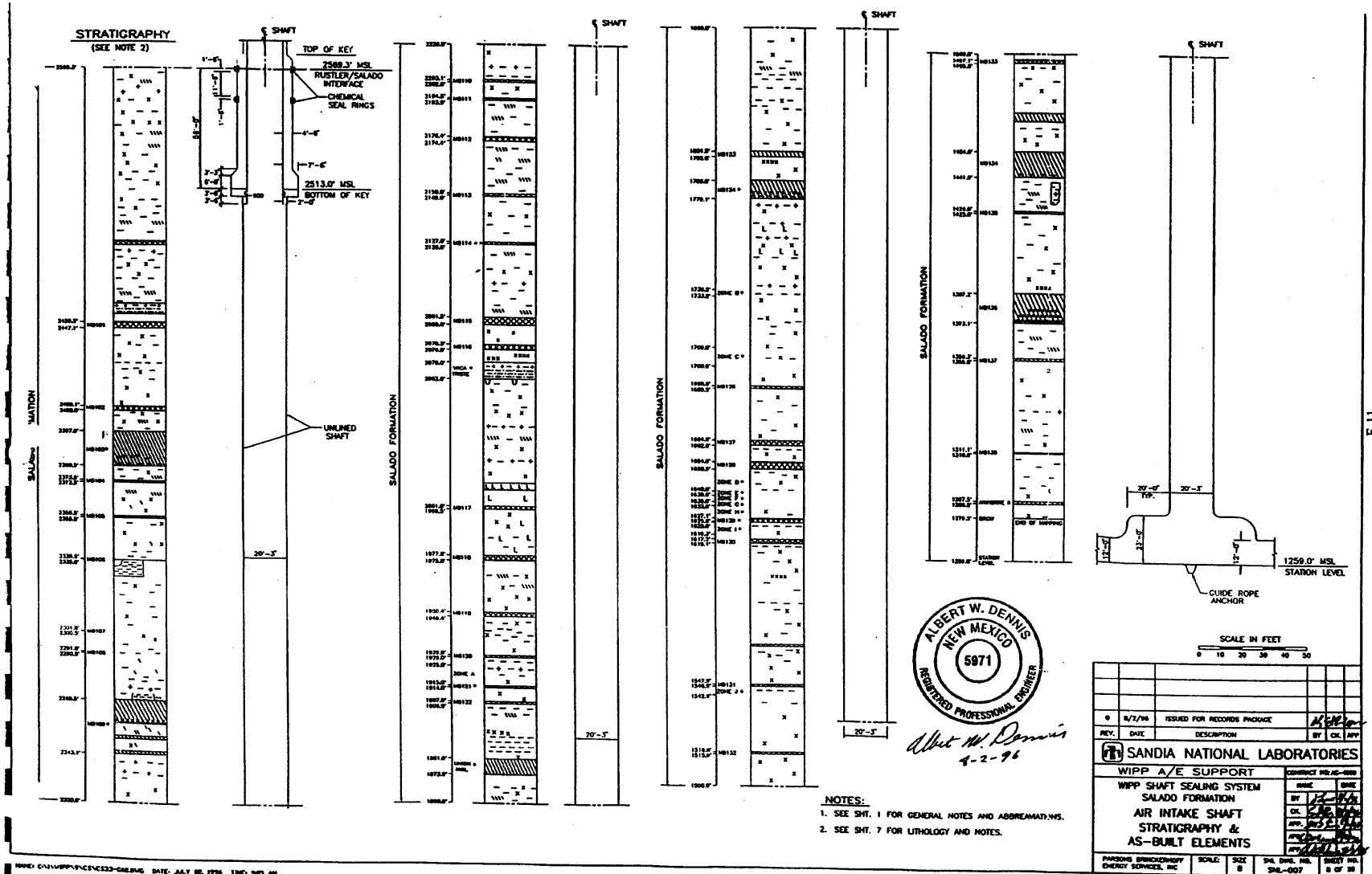


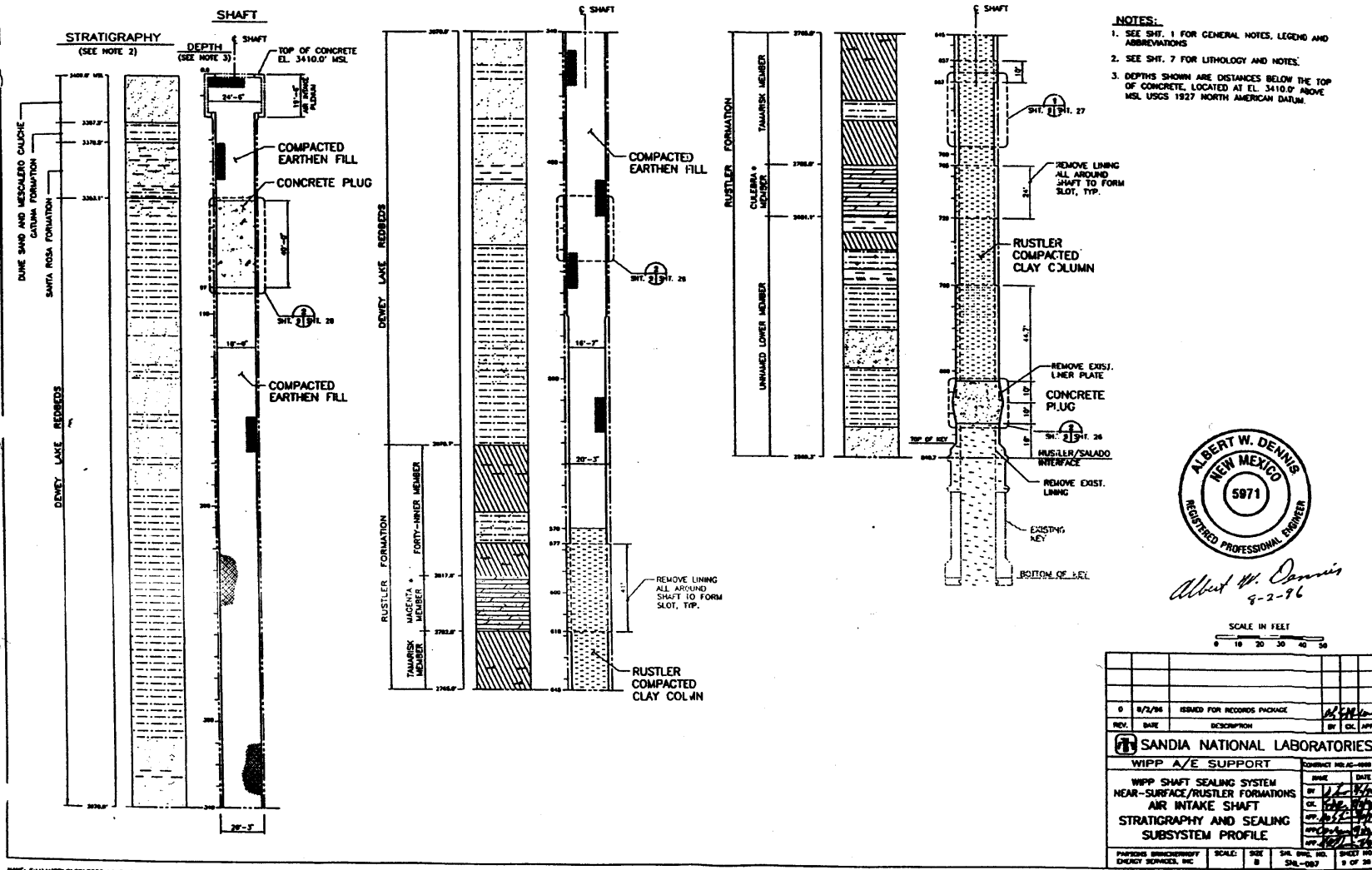


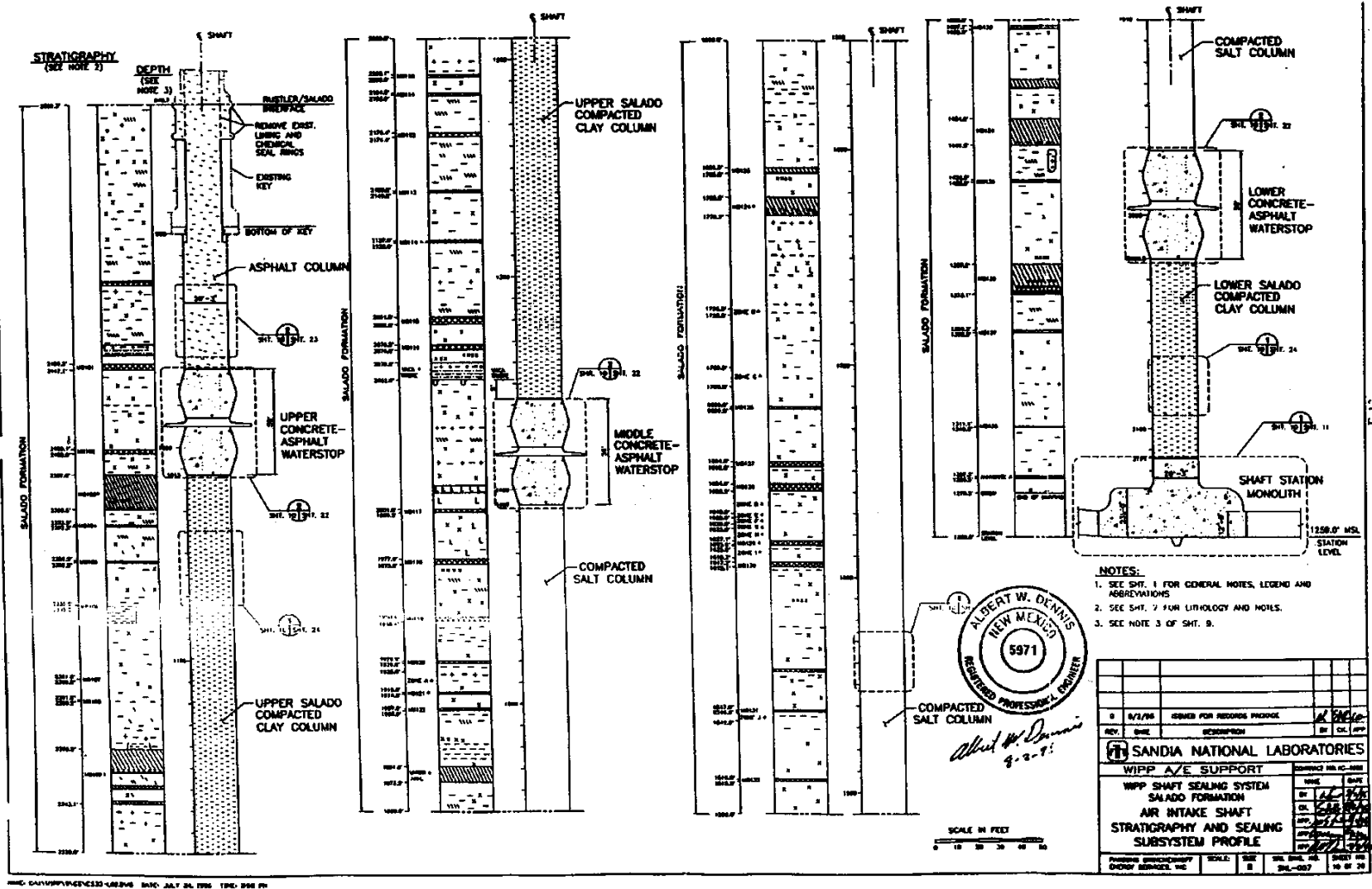


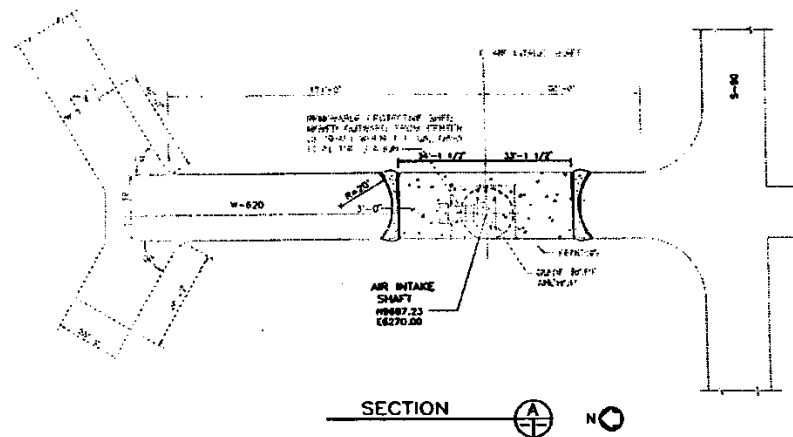
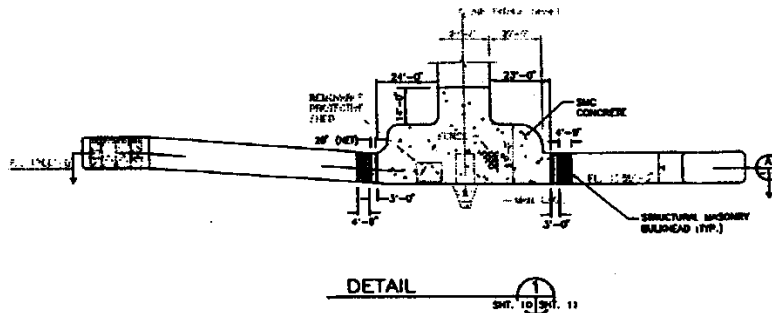












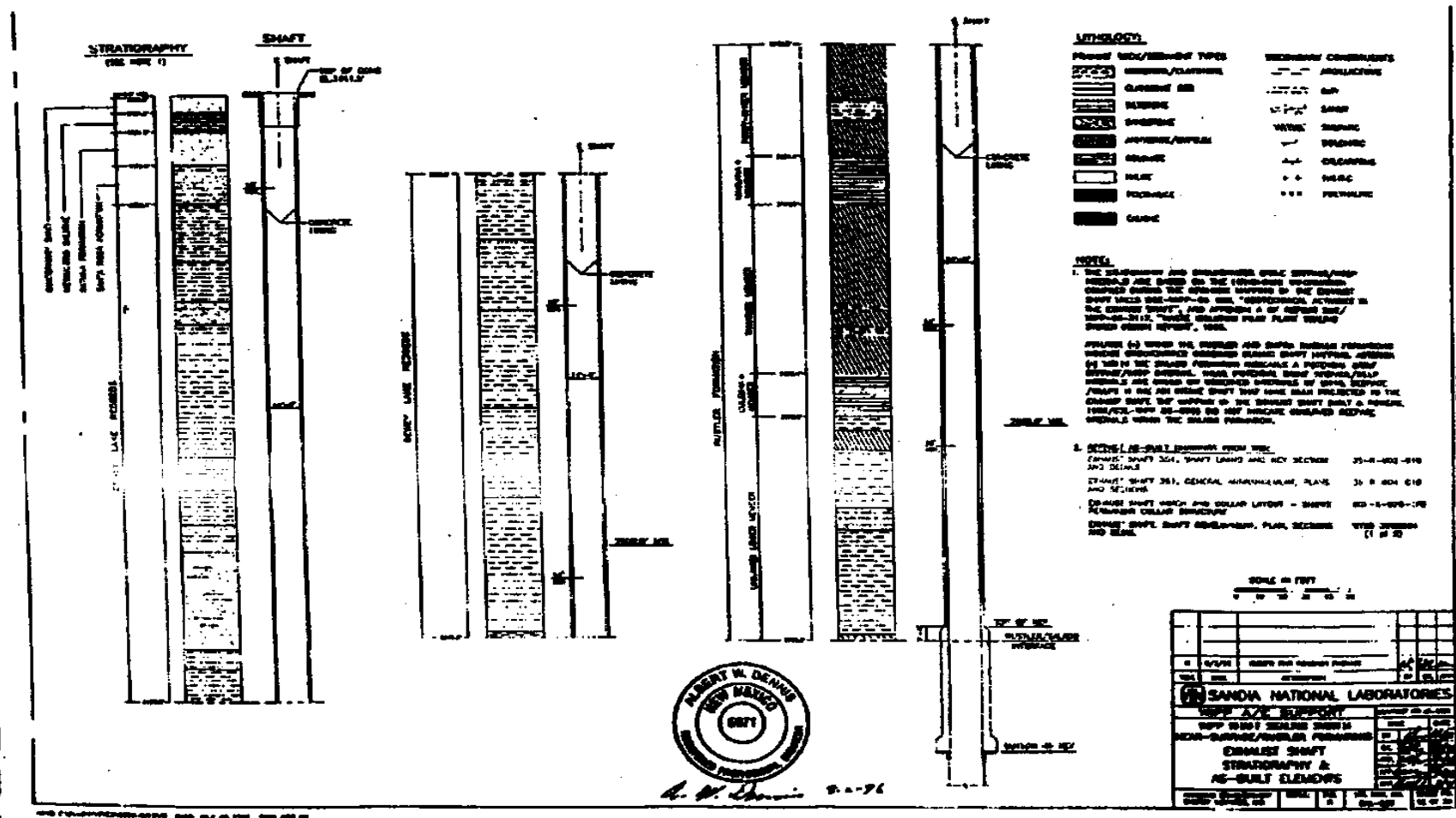
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1. SEE SMT. 1 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.



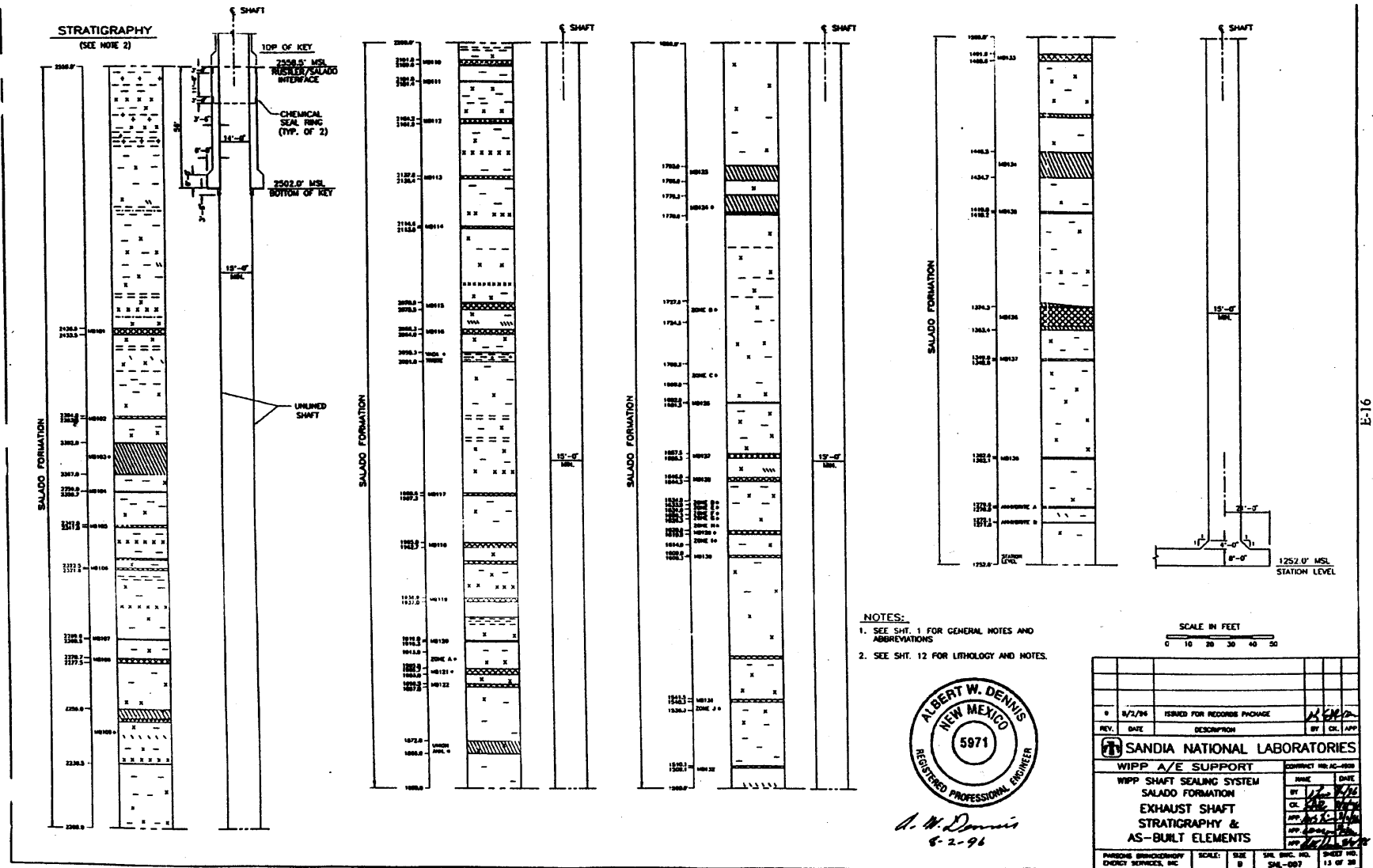
*A. W. Dennis*  
9-2-96

SCALE IN FEET  
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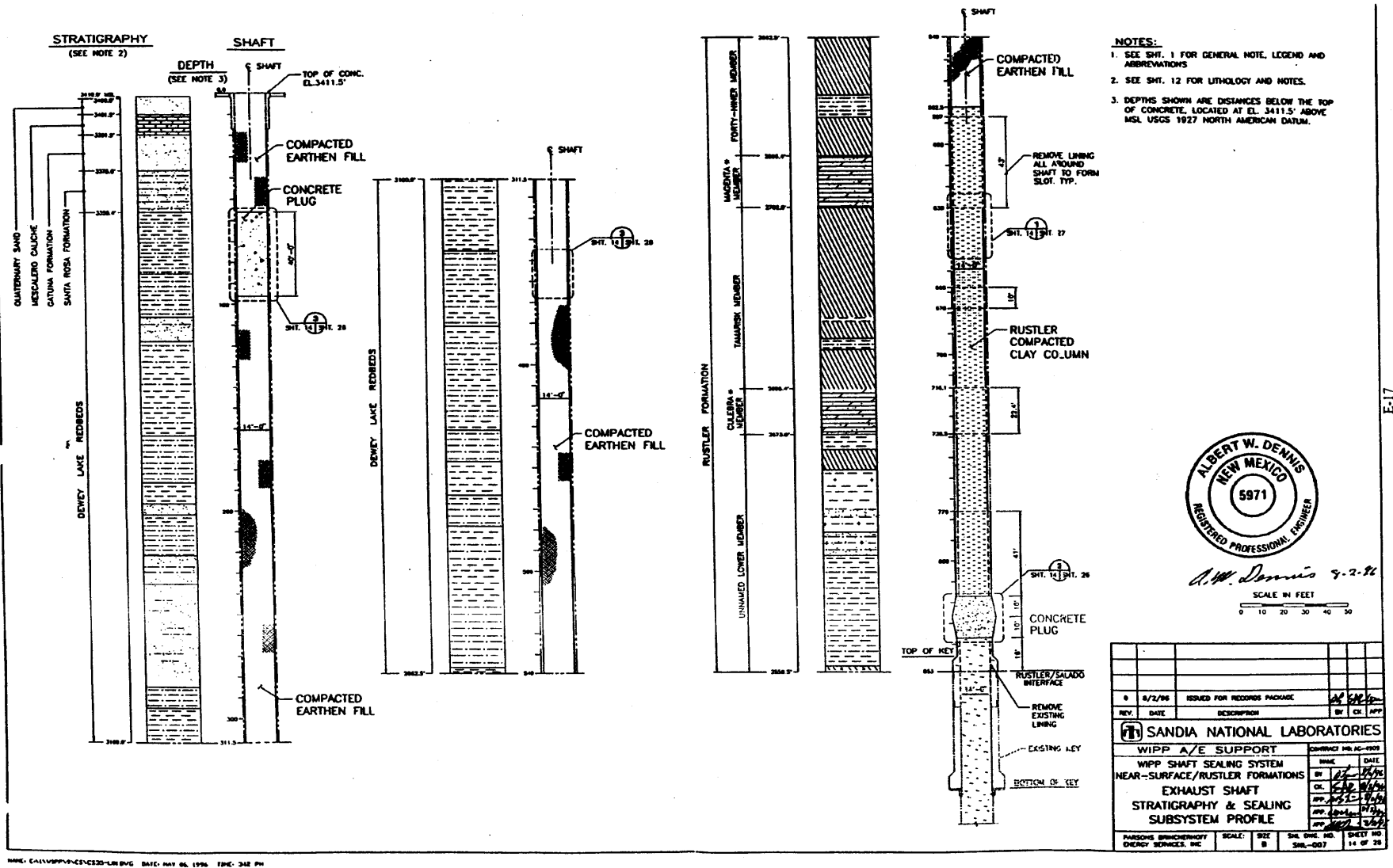
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PROJECT NO. 94-000000 SHEET NO. 11 OF 28				DATE: 9-2-96 BY: [Signature] CHK: [Signature]	



Waste Isolation Pilot Plant  
Hazardous Waste Permit  
October 27, 1999

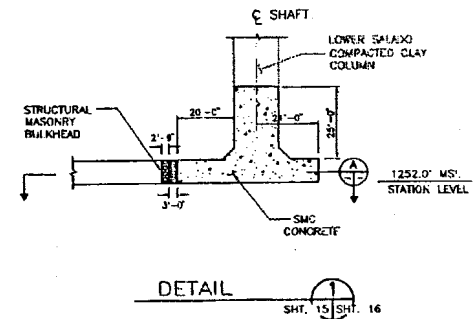
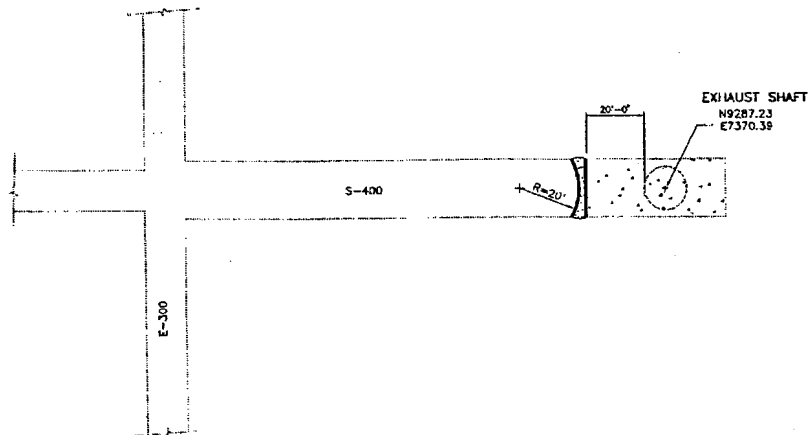






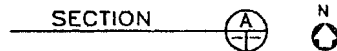
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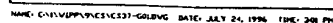
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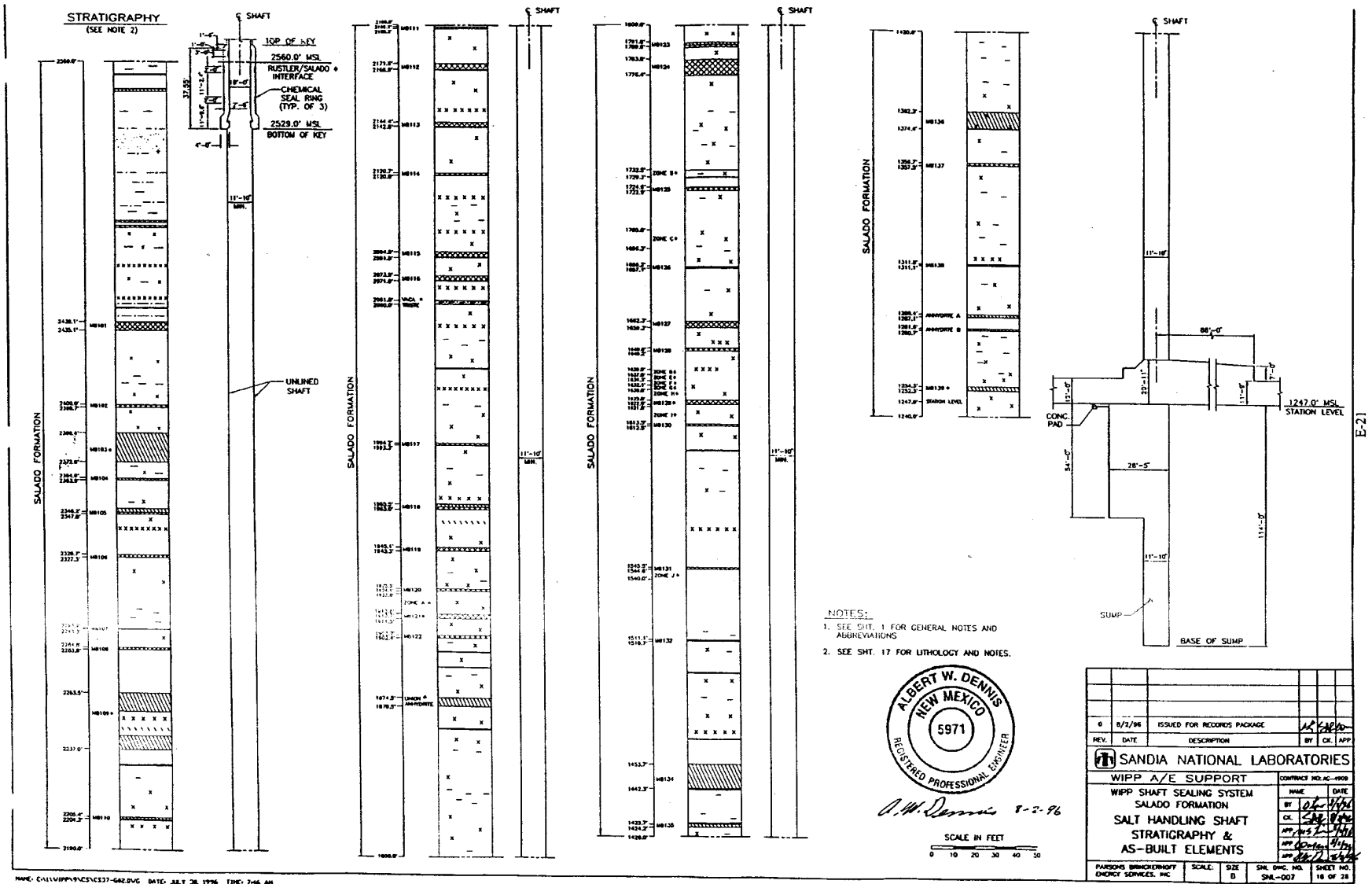
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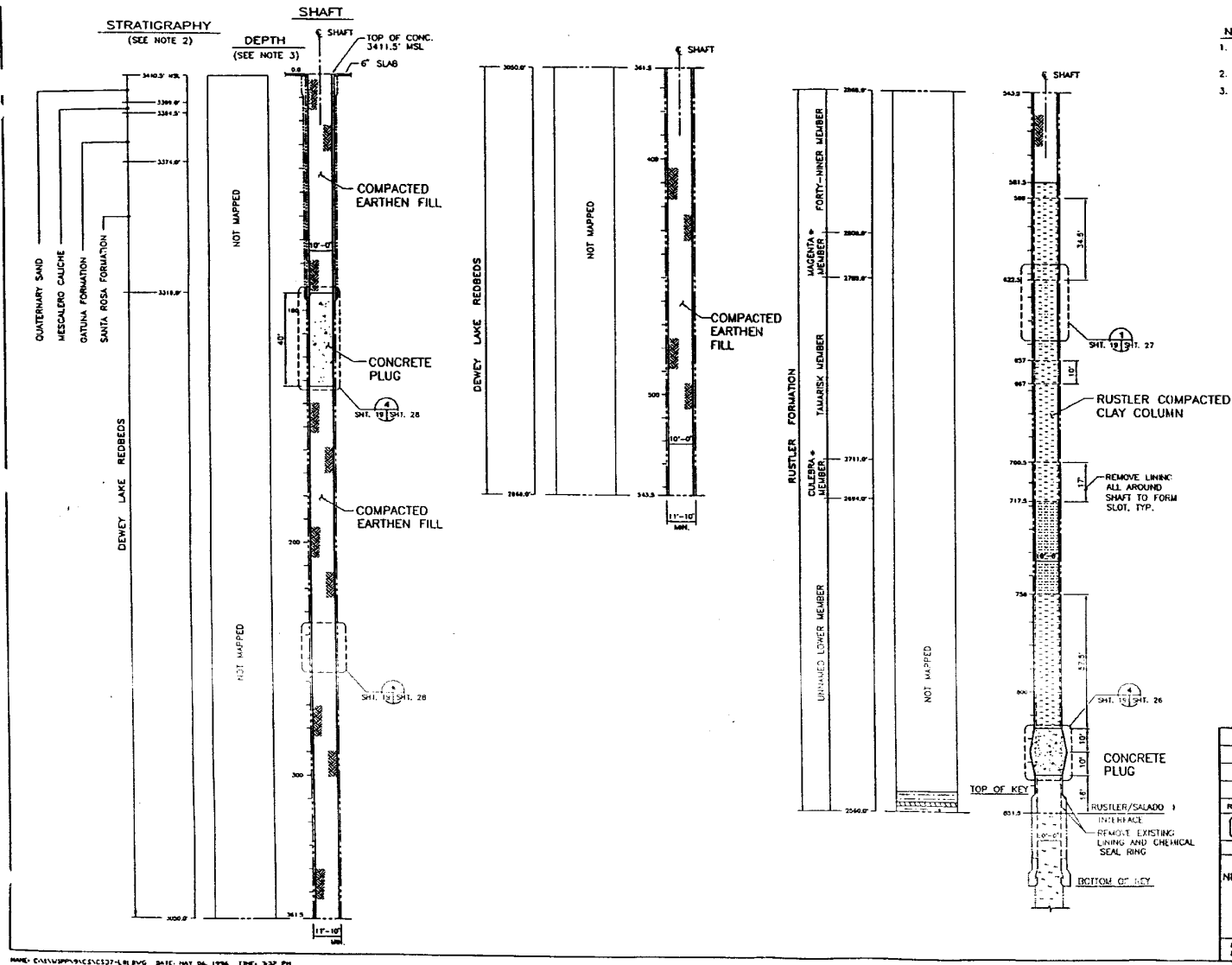


*A. W. Dennis 8-2-96*

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REV.	DATE	DESCRIPTION	BY	DATE
SANDIA NATIONAL LABORATORIES				
WIPP A/E SUPPORT				
WIPP SHAFT SEALING SYSTEM				
CONTRACT NO. NS-4009			NAME	DATE
			BY	DATE







- NOTES:**
1. SEE SHT. 1 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.
  2. SEE SHT. 17 FOR LITHOLOGY AND NOTES.
  3. DEPTHS SHOWN ARE DISTANCES BELOW THE TOP OF CONCRETE, LOCATED AT EL. 3411.5' ABOVE MSL USGS 1927 NORTH AMERICAN DATUM.

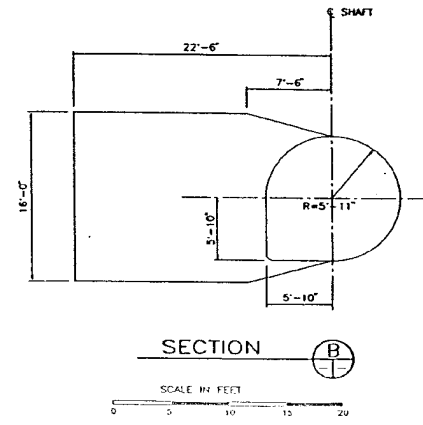
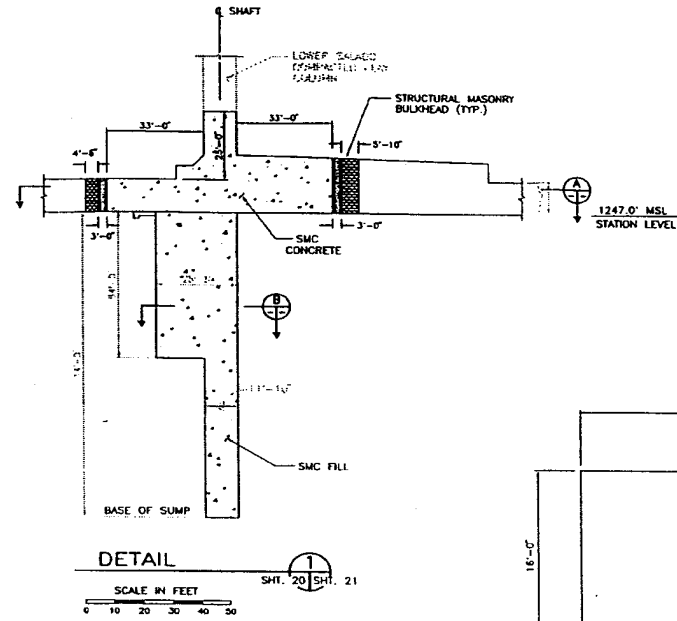
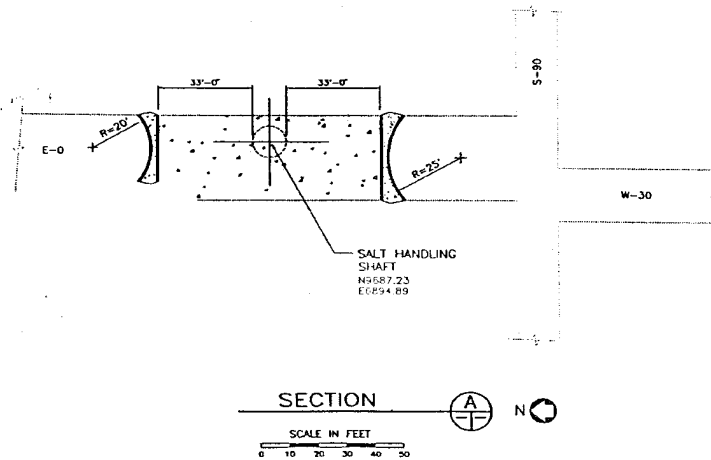


*Albert W. Dennis 9-2-96*

SCALE IN FEET  
0 10 20 30 40 50

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REV.	DATE	DESCRIPTION	BY	CHK. APP.
SANDIA NATIONAL LABORATORIES				
WIPP A/E SUPPORT				
WIPP SHAFT SEALING SYSTEM			NAME	DATE
NEAR-SURFACE/RUSTLER FORMATIONS			BY: <i>AL</i>	<i>8/2/96</i>
SALT HANDLING SHAFT			CHK: <i>AL</i>	<i>8/2/96</i>
STRATIGRAPHY & SEALING			APP: <i>AL</i>	<i>8/2/96</i>
SUBSYSTEM PROFILE			APP: <i>AL</i>	<i>8/2/96</i>
PARSONS BRINCKERHOFF ENERGY SERVICES, INC.		SCALE: 8	SHEET NO. 19 OF 28	SHEET NO. 19 OF 28





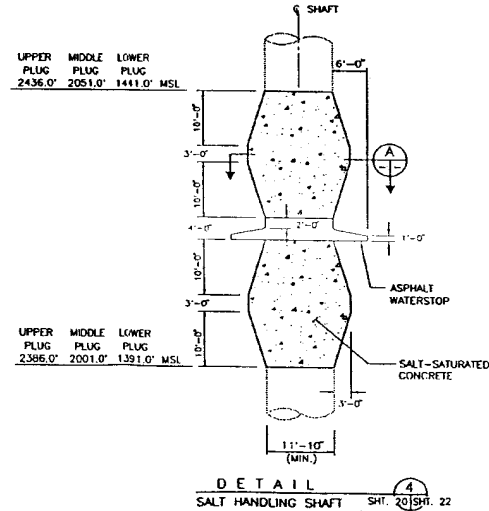
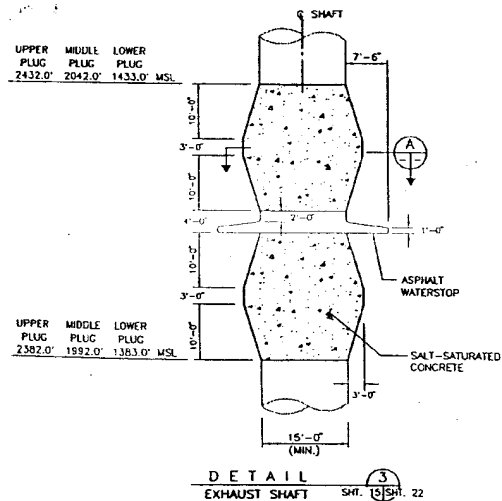
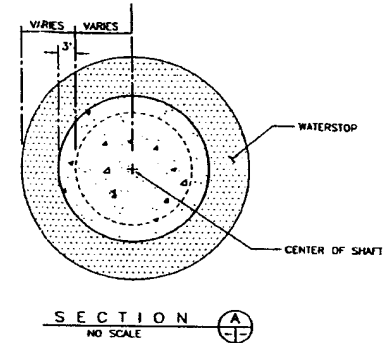
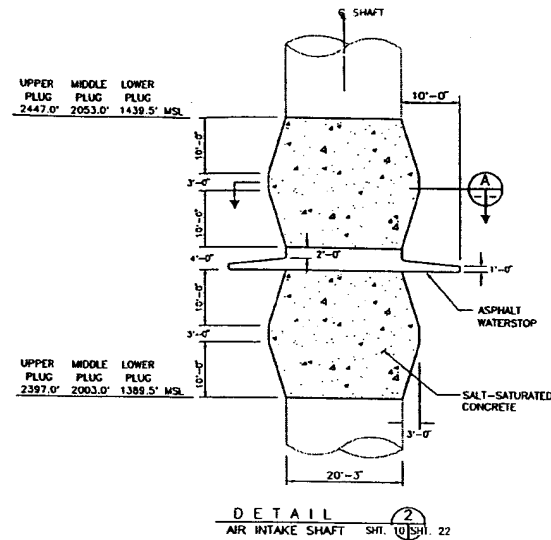
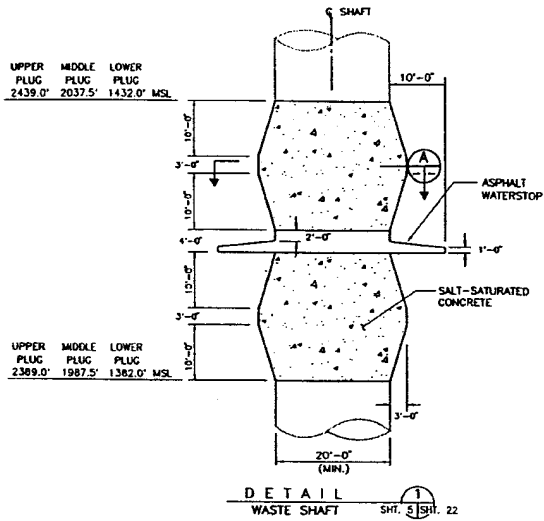
NOTES:  
1. SEE SHT. 1 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.



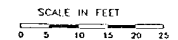
*Albert W. Dennis*  
8-2-96

REV.	DATE	DESCRIPTION	BY	CHK.	APP.
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WIPP A/E SUPPORT					
WIPP SHAFT SEALING SYSTEM					
SALT HANDLING SHAFT SHAFT STATION MONOLITH					
NAME	DATE	CONTRACT NO.	AC-4809		
BY					
CHK.					
APP.					
APP.					
APP.					
PARSONS BRINCKERHOFF ENERGY SERVICES, INC.	SCALE:	SIZE	SHEET NO.	SHEET NO.	
	B	B	SHL-007	21 OF 28	

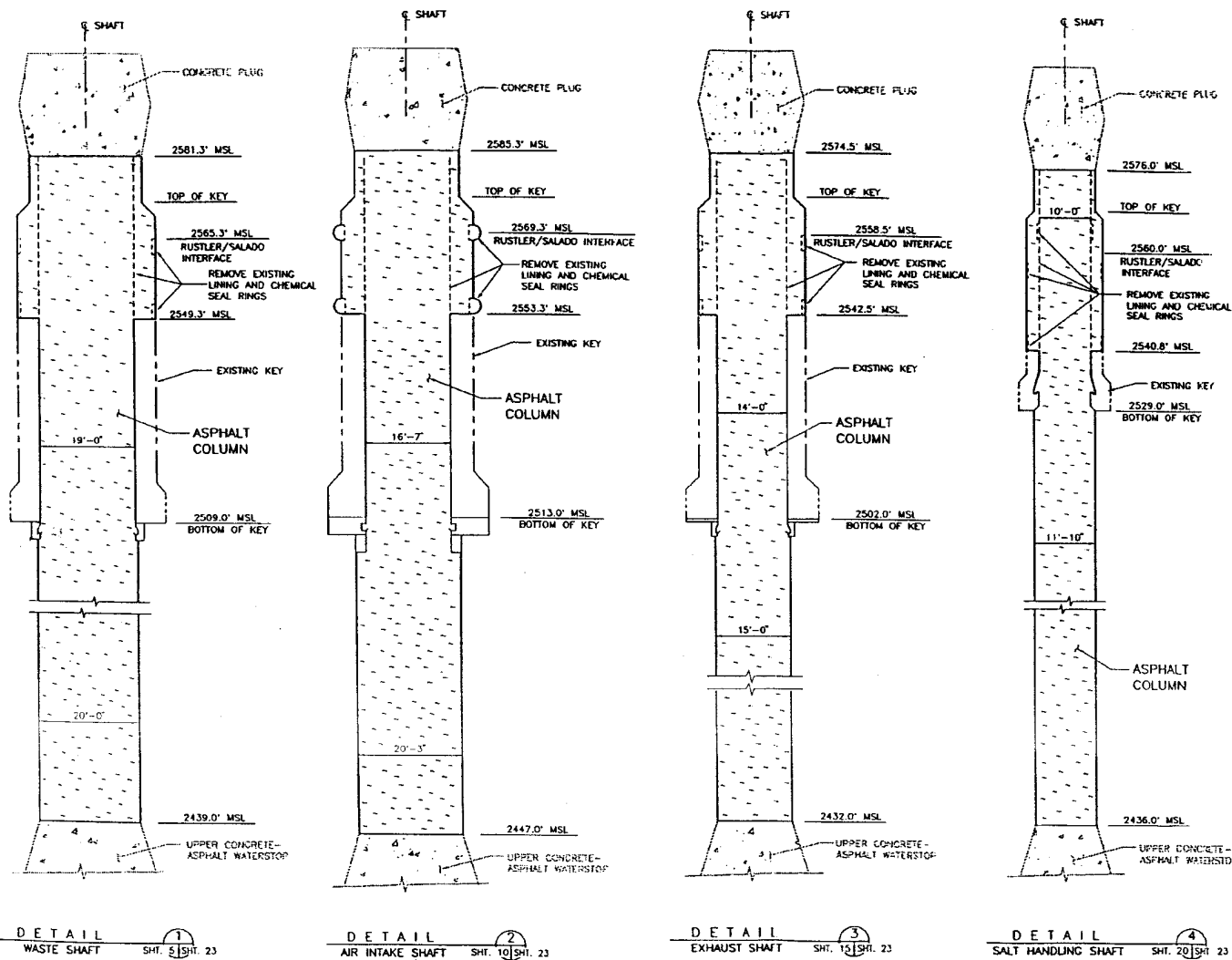




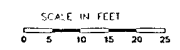
*Albert W. Dennis*  
1-2-96



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REV.	DATE	DESCRIPTION	BY	CK	APP
SANDIA NATIONAL LABORATORIES					
WIPP A/E SUPPORT					
WIPP SHAFT SEALING SYSTEM					
CONCRETE-ASPHALT WATERSTOP IN SALADO FORMATION					
NAME	DATE	CONTRACT NO.	NO.	NO.	NO.
BY	DATE	NO.	NO.	NO.	NO.
CK	DATE	NO.	NO.	NO.	NO.
APP	DATE	NO.	NO.	NO.	NO.
APP	DATE	NO.	NO.	NO.	NO.
PARSONS BRINCKERHOFF	SCALE:	SIZE	S&L DWG. NO.	SHEET NO.	
ENERGY SERVICES, INC.	B	B	S&L-007	22 OF 78	

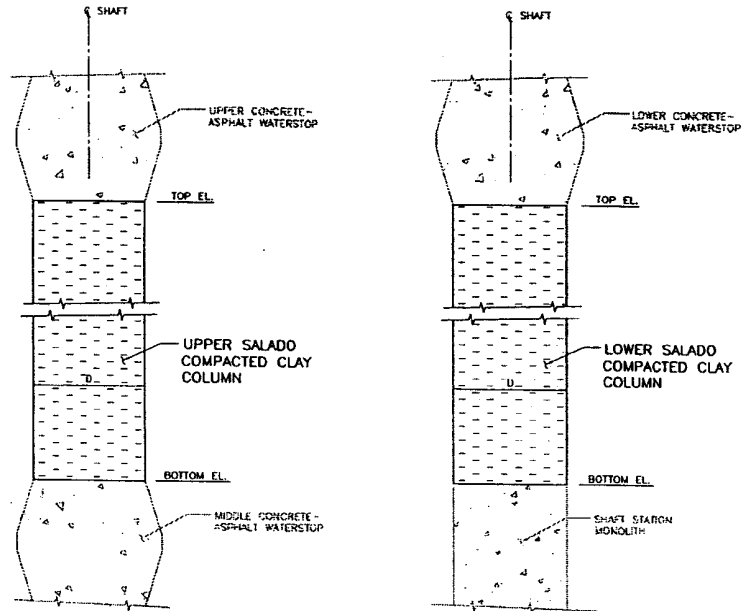


*Albert W. Dennis*  
8-2-96



0	5	10	15	20	25								
SCALE IN FEET													
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0	8/2/96	ISSUED FOR RECORDS PACKAGE	BY: [Signature]										
REV.	DATE	DESCRIPTION	BY: CK: APP										
<b>SANDIA NATIONAL LABORATORIES</b> WIPP A/E SUPPORT WIPP SHAFT SEALING SYSTEM ASPHALT COLUMN													
CONTRACT NO. AC-4009 NAME: [Signature] DATE: 8/2/96 BY: [Signature] CK: [Signature] APP: [Signature]		SHEET NO. 23 OF 28											

NAME: C:\V\WIPP\DESIGN\100-100.DWG DATE: MAY 06, 1996 TIME: 4:09 PM



DETAIL  
SEE TABLE 1 FOR DETAILS  
NO SCALE

SHT. 5  
SHT. 10  
SHT. 15  
SHT. 20

1  
SHT. 24

TABLE 1

SHAFT	NOMINAL SHAFT DIAMETER D	UPPER SALADO COMPACTED CLAY COLUMN			LOWER SALADO COMPACTED CLAY COLUMN		
		TOP EL. (FT. MSL)	BOTTOM EL. (FT. MSL)	TOTAL HT. (FT.)	TOP EL. (FT. MSL)	BOTTOM EL. (FT. MSL)	TOTAL HT. (FT.)
WASTE	20'-0"	2389.0	2037.5	351.5	1382.0	1286.0	96.0
AIR INTAKE	20'-3"	2397.0	2053.0	344.0	1389.5	1296.0	93.5
EXHAUST	15'-0"	2382.0	2042.0	340.0	1383.0	1285.0	98.0
SALT HANDLING	11'-10"	2386.0	2051.0	335.0	1391.0	1284.0	107.0

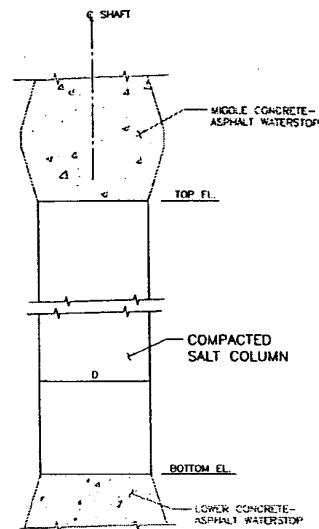


Albert W. Dennis  
9-2-96

0	8/2/96	ISSUED FOR RECORDS PACKAGE	BY: [Signature]
REV.	DATE	DESCRIPTION	BY: CK, APP
<b>SANDIA NATIONAL LABORATORIES</b> WIPP A/E SUPPORT WIPP SHAFT SEALING SYSTEM UPPER AND LOWER SALADO COMPACTED CLAY COLUMNS			
CONTRACT NO. AC-0005 NAME: [Signature] DATE: [Signature] CK: [Signature] APP: [Signature]		SCALE: [Signature] SIZE: [Signature] SML. Dwg. No.: SML-007 SHEET NO.: 24 OF 28	

NAME: C:\VIPP\PROJECTS\00-584-BUG DATE: MAY 06, 1996 TIME: 4:52 PM

Waste Isolation Pilot Plant  
Hazardous Waste Permit  
October 27, 1999



DETAIL  
SEE TABLE 1 FOR DETAILS  
NO SCALE

1  
SHT. 5 SHT. 25  
SHT. 10  
SHT. 15  
SHT. 20

TABLE 1

SHAFT	NOMINAL SHAFT DIAMETER D	COMPACTED SALT COLUMN		
		TOP EL. (FT. MSL)	BOTTOM EL. (FT. MSL)	TOTAL HT. (FT.)
WASTE	20'-0"	1987.5	1432.0	555.5
AIR INTAKE	20'-3"	2003.0	1439.5	563.5
EXHAUST	15'-0"	1992.0	1433.0	559.0
SALT HANDLING	11'-10"	2001.0	1441.0	560.0



*Albert W. Dennis*  
8-2-96

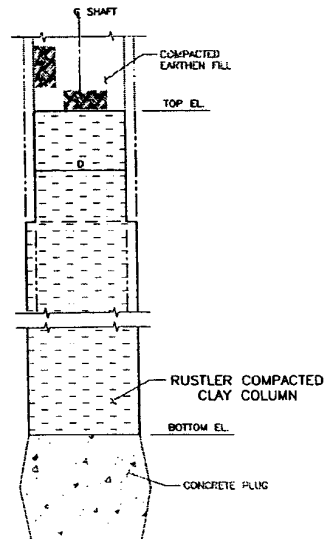
0	8/2/96	ISSUED FOR RECORDS PACKAGE	BY: <i>AKH</i>
REV.	DATE	DESCRIPTION	BY: <i>AKH</i>
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NAME: <i>AKH</i> DATE: <i>8/2/96</i>		CONTRACT NO. AC-480B SHEET NO. 25 OF 28	

WIPP-SALT/SHIELD/PROCESSOR-185.DWG DATE: MAY 06, 1996 TIME: 4:14 PM

### WIPP Shaft Sealing System Concrete Plug

Drawing SNL 007 26 of 28 not currently available. Drawing is not displayed in the Permit.

Waste Isolation Pilot Plant  
Hazardous Waste Permit  
October 27, 1999



DETAIL  
SEE TABLE 1 FOR DETAILS  
NO SCALE

SH. 4  
SH. 9  
SH. 14  
SH. 19

SH. 27

TABLE 1

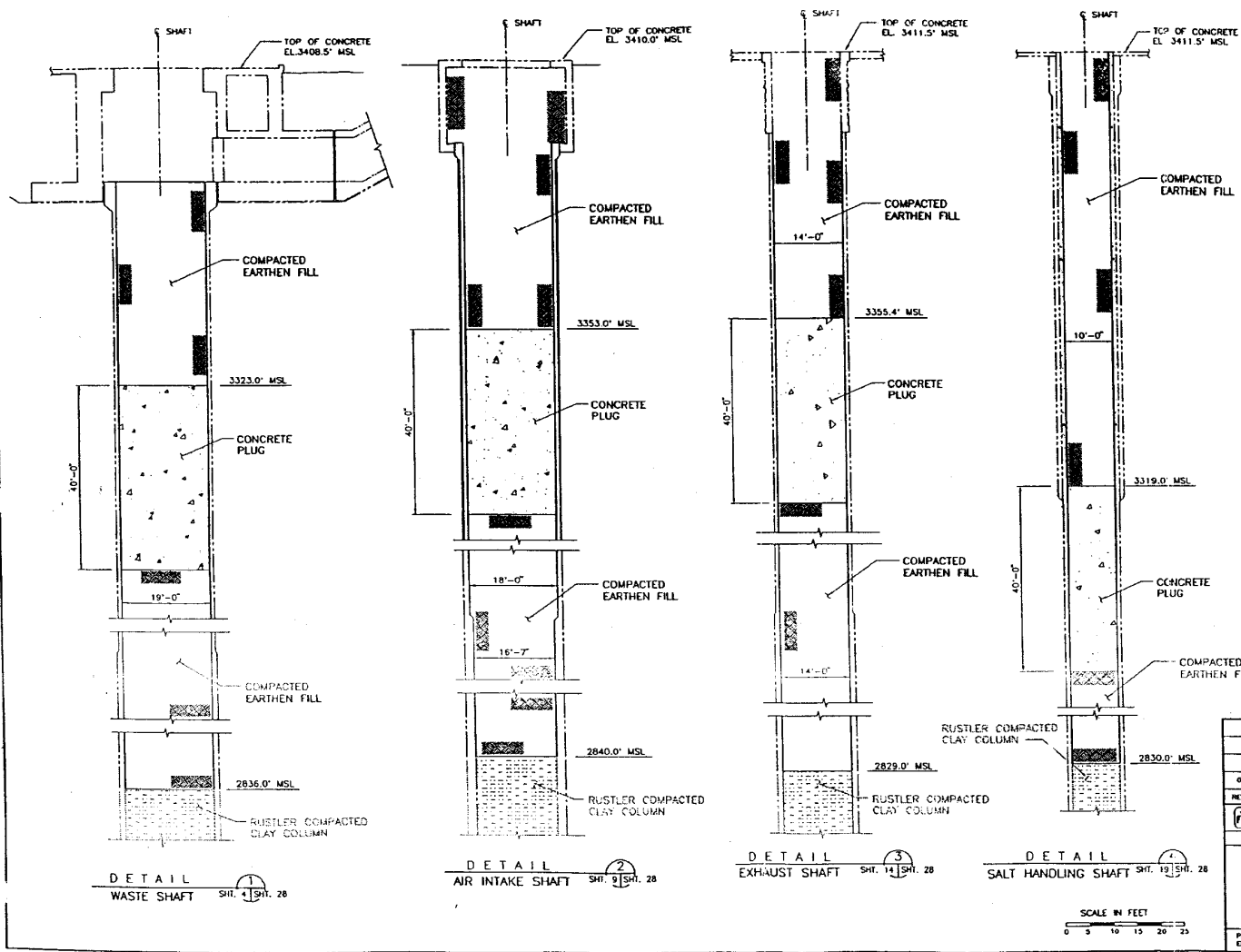
SHAFT	NOMINAL SHAFT DIAMETER D	RUSTLER COMPACTED CLAY COLUMN		
		TOP EL. (FT. MSL)	BOTTOM EL. (FT. MSL)	TOTAL HT. (FT.)
WASTE	19'-0"	2836.0	2601.3	234.7
AIR INTAKE	16'-7"	2840.0	2605.3	234.7
EXHAUST	14'-0"	2829.0	2594.5	234.5
SALT HANDLING	10'-0"	2830.0	2596.0	234.0



*Albert W. Dennis*  
9-2-96

REV.	DATE	DESCRIPTION	BY	CHK	APP
1	8/1/96	ISSUED FOR RECORDS PACKAGE	AWD		
SANDIA NATIONAL LABORATORIES					
WIPP A/E SUPPORT					
WIPP SHAFT SEALING SYSTEM					
RUSTLER COMPACTED CLAY COLUMN					
PARSONS BRINCKERHOFF ENERGY SERVICES, INC.			SCALE:	SIZE:	SHEET NO.
			8	27 OF 28	

E-30



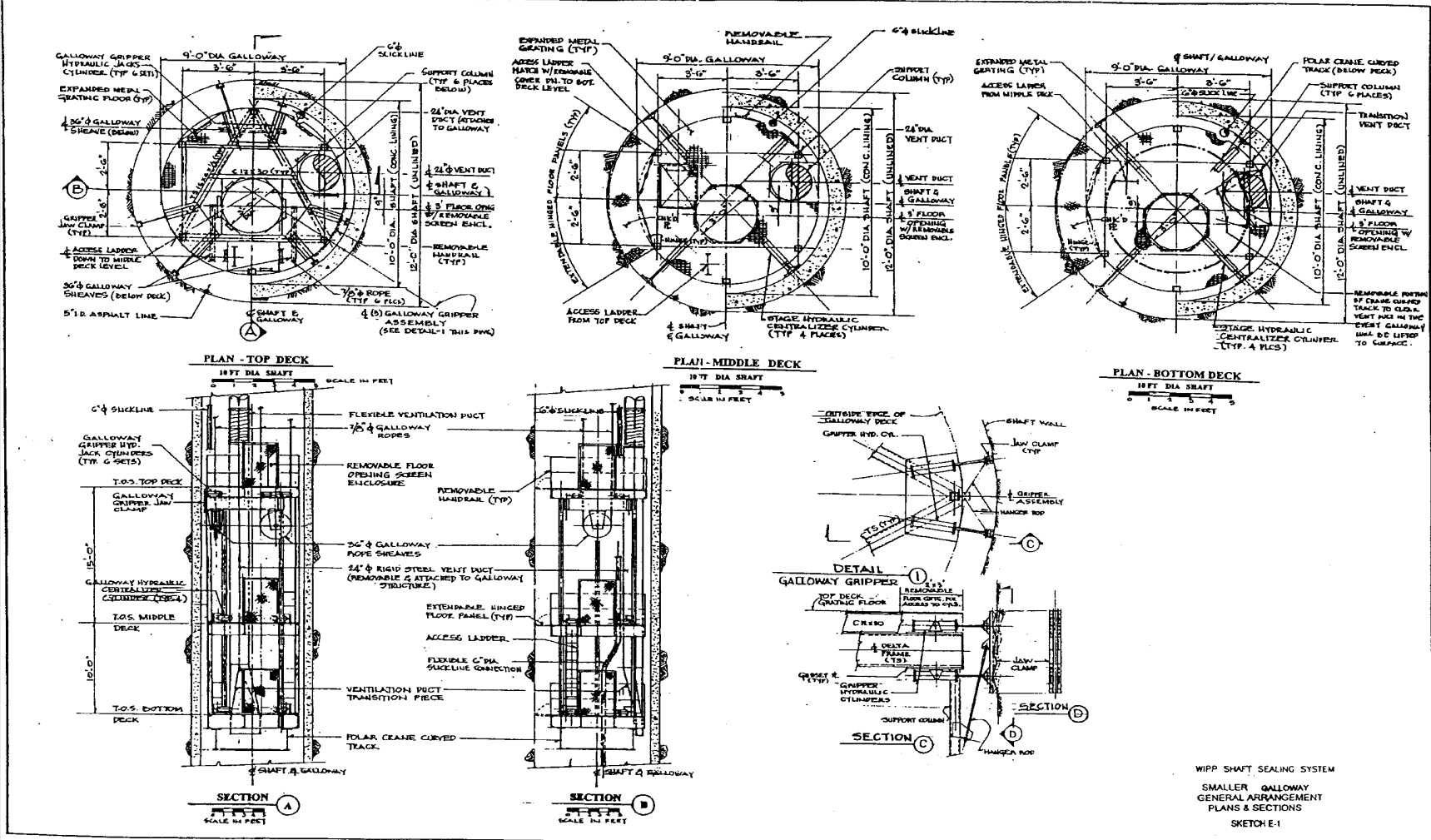
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0	8/2/96	ISSUED FOR RECORDS PACKAGE	BY: SH. 28
REV.	DATE	DESCRIPTION	BY: CL. APP.
SANDIA NATIONAL LABORATORIES			
WIPP A/E SUPPORT		CONTRACT NO. AC-4999	
WIPP SHAFT SEALING SYSTEM		NAME	DATE
COMPACTED EARTHEN FILL AND CONCRETE PLUG		BY: SH. 28	8/2/96
		CL: SH. 28	8/2/96
		APP: SH. 28	8/2/96
		APP: SH. 28	8/2/96
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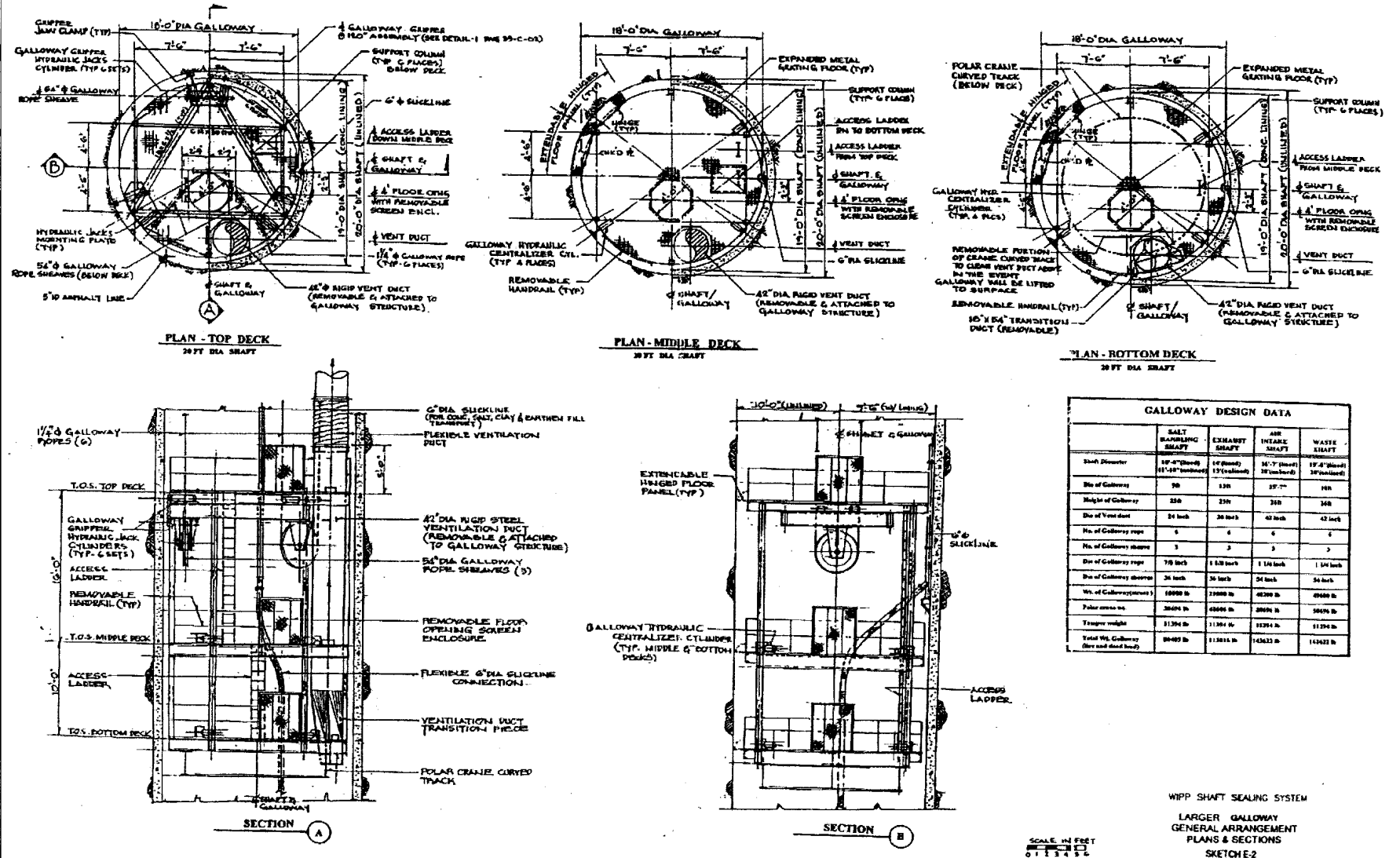
WASTE ISOLATION PILOT PLANT  
CARLSBAD, NM  
SHAFT SEALING SYSTEM DESIGN  
EQUIPMENT AND CONSTRUCTION SKETCHES

DRAWING NUMBER	TITLE
SKETCH E-1	WIPP SHAFT SEALING SYSTEM SMALLER GALLOWAY GENERAL ARRANGEMENT PLANS AND SECTIONS
SKETCH E-2	WIPP SHAFT SEALING SYSTEM LARGER GALLOWAY GENERAL ARRANGEMENT PLANS AND SECTIONS
SKETCH E-3	WIPP SHAFT SEALING SYSTEM TYPICAL HEADFRAME PLANS AND SECTIONS
SKETCH E-4	WIPP SHAFT SEALING SYSTEM PERSPECTIVE HEADFRAME AND ASSOCIATED SURFACE FACILITIES

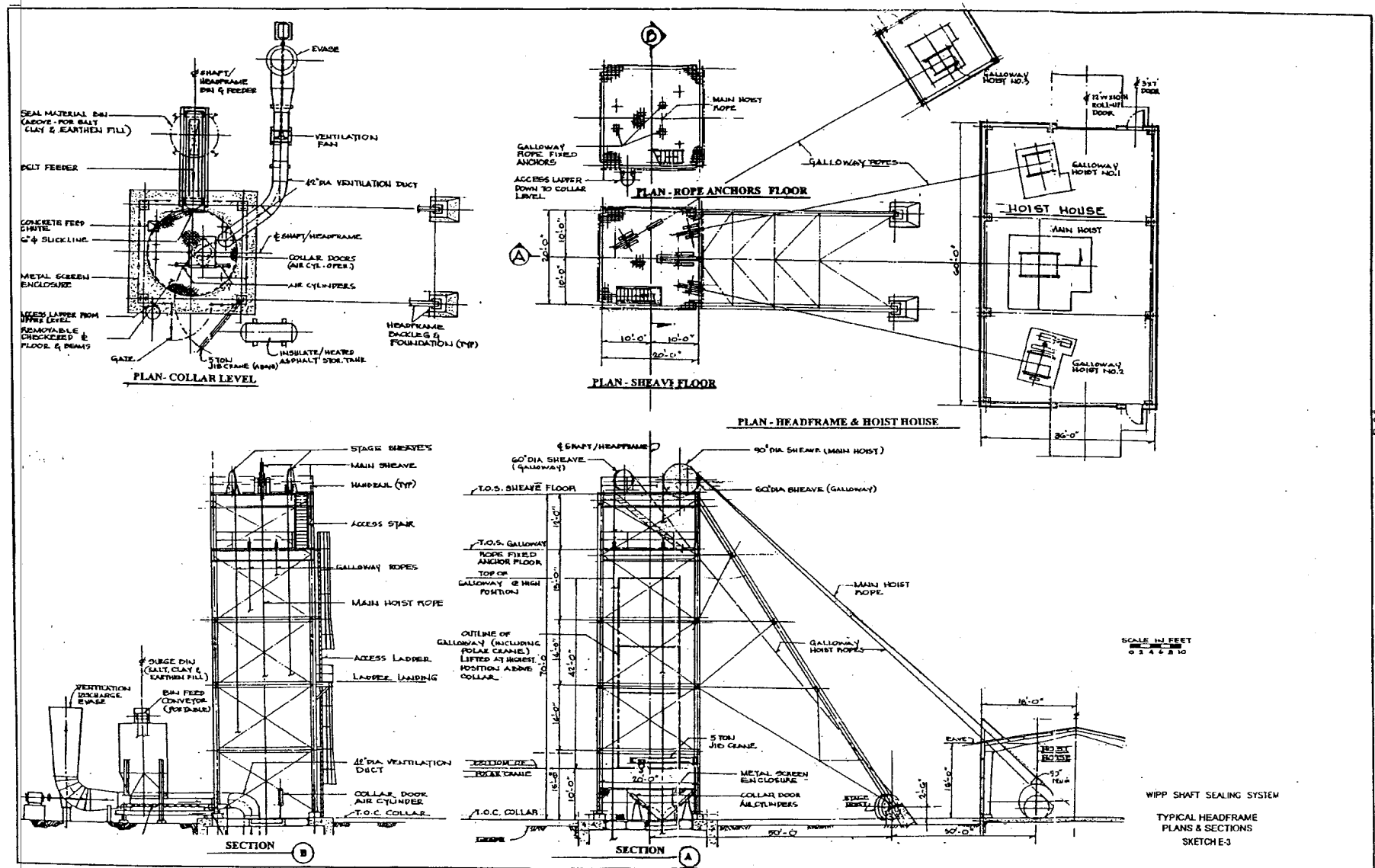




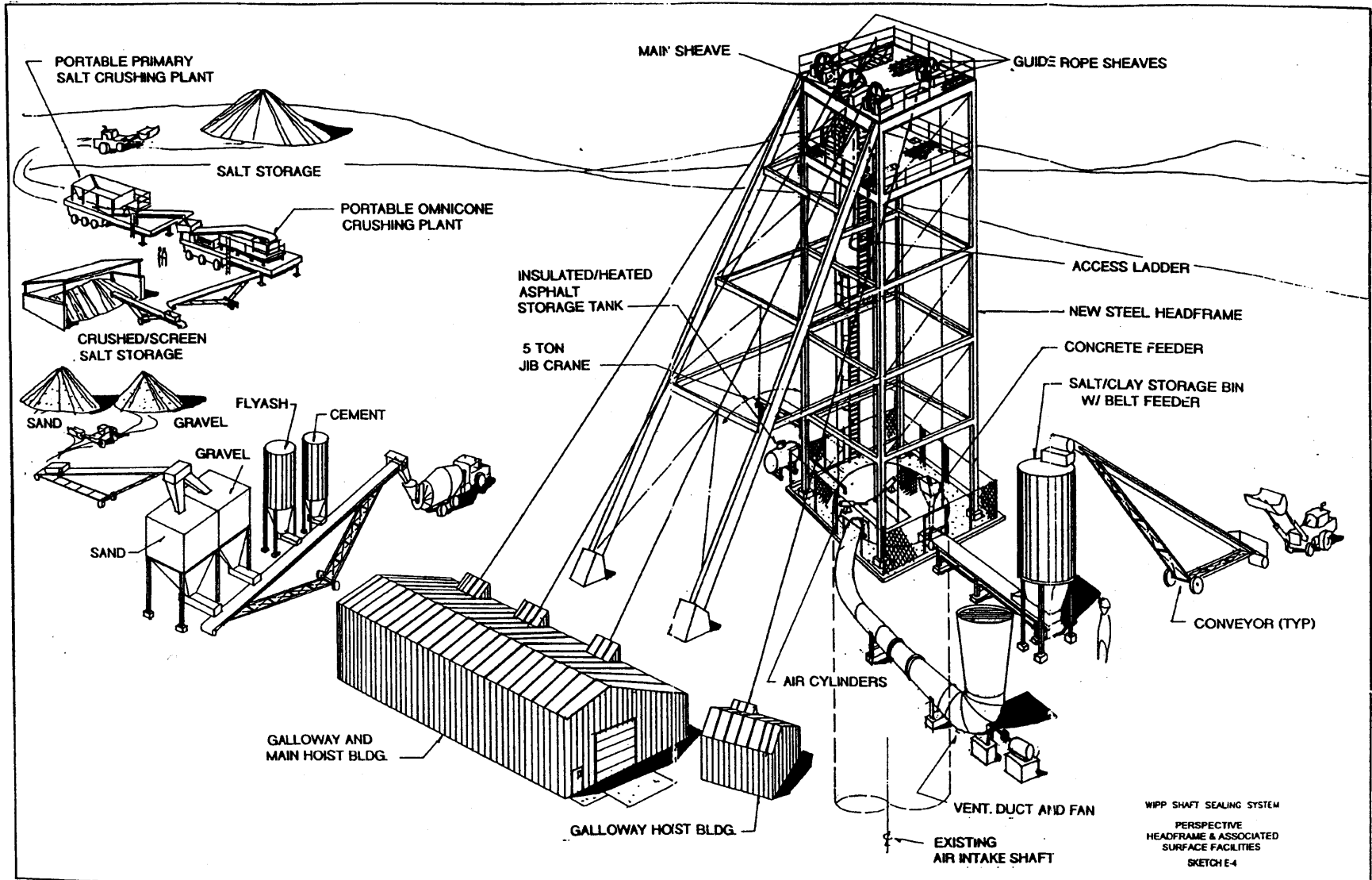
WIPP Shaft Sealing System Smaller Galloway Genral Arrangement Plans and Sections



WIPP Shaft Sealing System Larger Galloway General Arrangement Plans and Sections



WIPP Shaft Sealing System Typical Headframe Plans and Sections



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WIPP Shaft Sealing System Typical Headframe and Associated Surface Facilities

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**Waste Isolation Pilot Plant  
Shaft Sealing System  
Compliance Submittal Design Report**

**Volume 2 of 2:  
Appendix E**

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**ABSTRACT**

This is the second volume of a two-volume report describing a shaft sealing system design for the Waste Isolation Pilot Plant. This appendix contains detailed drawings of the shaft sealing system and its components.